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Exploration of Study Strategies Used by Spelling Disabled Children: A Qualitative Comparison of Three Teaching Approaches

by

©

JAC ANDREWS

A THESIS
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Abstract

This study explored the strategy employment of three learning disabled boys when studying familiar spelling words. Furthermore, it examined the qualitative differences between three instructional approaches used for spelling remediation. A principle aim of the study was to discover what skills or plans (strategies) the subjects used to aid their studying of spelling words due to the belief that ability deficits alone could not account for their delayed spelling achievement. An integration of standardized and informal assessment measures along with an investigation of cognitive processes (metacognition) was utilized in order to better appreciate their spelling difficulty. Additionally, a self-instructional design based on cognitive behavior modification (CBM) principles was developed and provided to one of the subjects in order to assess its' effectiveness compared to a traditional and direct method of instruction/ remediation. The results revealed that all the subjects had deficient linguistic ability for their age and grade level but were able to report a basic understanding of the parameters involved in studying spelling words and were able to select and verbalize preferred study strategies. However, they failed to use their spelling metacognition in a regulated and effectual manner. It was concluded that their spelling performance was deliteriously influenced by their ability deficits along with their inability to monitor and check their studying performance and use their preferred strategies efficiently and consistantly.The qualitative comparisons between the three instructional approaches indicated that the self-instructional and direct methods were appreciated more than the traditional method. The subjects' active participation in the spelling remediation appeared to be a motivating factor along with influencing a more positive perception of ability in spelling. Additionally, the results indicated that the self-instructional (CBM) design appeared to enhance the subjects' acquisition and maintenance of correctly spelled familiar words along with improving prediction of spelling performance to 100% accuracy. Generally, the results further supported the potential of CBM and the exploration of metacognition both in research and as an added dimension of an academic assessment battery.

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I. Introduction

This study involved a single subject qualitative analysis of spelling ability utilizing three students. The principle aim was to do an indepth assessment of the strengths and weaknesses of students who had difficulty with spelling and explore the strategies they used for studying familiar spelling words. Secondly, to examine the qualitative differences between a self-instructional (cognitive behavior modification), direct and traditional approach to spelling remediation.

The students in this study were considered learning disabled with respect to their delay in spelling performance. They all had a significant below grade level performance in spelling in spite of having intelligence within the normal range. Their difficulties were not the result of primary sensory, physical or emotional problems which could have warranted their performance delay. Due to their classification this thesis begins by introducing the reader to the current definitions of learning disabilities and describes its' inherent characteristics. This description is followed by a review of some of the important considerations relevant to needs of these students and the implications with respect to educational practice.

The next section contains a general review of the contemporary literature on spelling. Spelling is a complex task which is confounded by the irregular orthographic patterns of the English language and the inconsistent letter sound correspondences. The variables involved in spelling performance are as diverse as the approaches used to teach and remediate spelling acquisition. There are many issues to contend with and many research problems to evaluate. Therefore, program designers need to be selective when choosing appropriate methods to be used with students. This section identified the major findings with respect to spelling and used them in the remediation approaches with the children in this study. Each childs' spelling remediation was provided by utilizing one of the three approaches that was facilitated by their instructor. The direct approach was designed and guided by the assessed needs of one of the students. The traditional approach utilized a provincially approved spelling program to remediate another youngsters' difficulty. The self-instructional approach which incorporated a cognitive behavior modification design was used with the remaining student.

The following section investigates the literature as it pertains to the strategy employment of learning disabled children along with describing its' relationship with cognitive behavior modification (CBM). CBM was used in this study as a selfinstructional approach to spelling remediation. To date, the CBM approach has not been used within a spelling context, hence, a fairly extensive description and review of this technique and its' salient features along with its' application with spelling was warranted. The students' spelling performance was analyzed by using various analytic tests. Their method for studying familiar spelling words was analyzed by observing their study activity and by probing them with respect to the strategies they employed when given a spelling study assignment.

This focus was inspired by a widespread belief that ability deficits alone cannot account for the total variance underlying the performance difficulties of children with learning problems (Brown, 1980; Flavell, 1976). Presently, children with learning problems are usually identified by their poor performance on academic tasks without examining the students' knowledge of operations that may allow for efficient performance to occur. The delineation of how children derive solutions to problems on academic tasks involves the examination of processes. More specifically, childrens' knowledge of strategies to use in spelling versus regulation of these strategies was considered to be important for assessment/remediation. Hence, this section reviewed the literature with respect to performance and process along with its' placement within the metacognitive domain. Therefore, a description of this domain and its' application to spelling acquisition was also included.

The next section states the research proposal and design which leads to a description of the students' assessment and instructional programs. This is followed with the answers to the specific research questions and a general discussion.

II. Review of the Literature

A. Learning Disabilities and Educational Cosiderations

Many children with learning problems have been diagnosed as learning disabled , however, there is little consensus on the meaning of this term. "One of the first descriptive studies of learning disabilities, by Morgan, a physician, appeared in the British Medical Journal in 1896. He described the case of an intelligent 14 year old boy who had unusual reading and writing difficulties and termed the difficulty "word blindness". The boy's difficulty included confusion of the sequential order of the letters in his name, spelling errors and difficulties in learning the letters of the alphabet as a young child" (Sattler, 1982, p.391). "The term learning disability can be used in a broad and narrow sense. In the broad sense it refers to learning difficulties that can be associated with any type of factor, including mental retardation, brain injury, sensory difficulties, or emotional disturbances. In the narrow sense it refers to the failure to learn a scholastic skill by a child who has adaquate intelligence, maturational level, and cultural background. The narrower meaning is termed "specific learning disability"(Sattler,1982,p.391). It is defined as follows in Public Law 94-142 (Federal Register, December 29, 1977)":

> "Specific learning disability means a disorder in one or more of the basic psychological processes

> involved in understanding or using language, spoken or written, which may manifest itself in an imperfect ability to listen,think, speak,read,write,spell, or do mathematical calculations. The term includes conditions such as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, or of enviromental, cultural, or economic disadvantage" (Sattler,1982,pg. 391).

In early 1981 the National Joint Committee for Learning Disabilities (NJLCD) representing a number of professional organizations proposed the following definition of learning disabilities:

> Learning disabilities is a generic term that refers to a heterogenous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning or mathematical abilities. These disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction.
>
> Even though a learning disability may occur concomitantly with other handicapping conditions (eg. sensory impairment, mental retardation, social

and emotional disturbance) or enviromental influences (eg. cultural differences, insufficient/inappropriate instruction, psychogenic factors) it is not the direct result of those conditions or influences(Leong, 1982).

In educational settings the learning disabled are usually defined as those students who are primarily characterized by their significant below grade level performance in one or more academic subjects in spite of having intelligence within the normal range. These children do not have primary sensory, physical or emotional problems which might warrant the school difficulties, hence these are children failing to achieve for no apparent reasons (Bryan and Pearl, 1979; Chapman, 1979).

Kirk (1963) originally proposed the term learning disability to denote those children with language disabilities (Leong, 1982). The most prominant learning disability is reading disabiliy, others include writing, spelling and arithmatic (Sattler, 1982). The five disabilities that differenciate disabled from non disabled children are in reading comprehension, attention, auditory visual co-ordination, writing and auditory speed of perception (Wissink et al., 1975). There is also a distinction made between terms related to a behavioral and psychological levels of learning disability such as "dyslexia" and terms related to an etiological level such as"brain damage" (Sattler,1982,pg.391).

One of the most common learning disabilities is associated with spelling (Sattler,1974). Spelling is a very difficult subject for youngsters due to all the required skills that are necessary for successful performance. The difficulty is further confounded by the complexity of English orthography that does not allow one to use consistent rules. Additionally, it is a very difficult subject to teach because of the heterogenity of the student population and variety of problems that learners can experience. The practice for many years has been to teach spelling in conjunction with exercises provided in published spelling workbooks (Smith,1981). For many youngsters this procedure aids spelling performance. Furthermore, many teachers appreciate spelling workbooks because the material is very accessable and provides a lesson plan that includes practice with the various dimensions of spelling (word lists that are arranged according to ability levels, phonic exercises, dictionary practice, word analysis, etc.). However, many children like the learning disabled do not seem to benefit from this traditional group method (Smith, 1981).

If as educators we realize that learning disabled children not only suffer from inadequate performance but also from a relatively long experience with failure we can begin to look at the neccessity of programs to be functional,therapeutic and individualized.

The integration of academic and affective remediation programs has been recommended by others (Black, 1974) and seems appropriate because school failure experiences often result in extreme feelings of discomfort, tension and anxiety (Gever,1970). Programs for children with learning disabilities should attempt to increase academic achievement, self perception of ability and self image. Support for this assumption comes from research done at the University of Minnesota. Preliminary data was analyzed from 37 learning disability teachers and 36 school psychologists on information considered useful in instructional planning and greatest needs of learning disabled students. Improved academic skills were clearly viewed as the greatest need of learning disabled students by school psychologists while improved self image was given equal importance to academic skills by learning disability teachers (Thurlow & Greener, 1980).

Many researchers indicate that if a child is not neurologically impaired ,difficulties may be due to inefficient problem solving strategies (Diener & Dweck,1978, Swanson,1979, Torgesen, 1977). When learning disabled children have been given learning strategies plus knowledge of the causative relationship between strategy use and performance there has been beneficial effects (Kennedy & Miller, 1976).

The diagnosis of performance deficit is only part of the treatment prescription for the learning disabled child.

Self image is also a very important factor of any remedial program. Kirk (1972) asserts that to be recognized as a worthwhile individual is one of the universal desires of mankind. How others respond to your behavior, communication, appearance, athletic ability academic performance, intelligence and other significant attributes influences how you think about them and yourself. The more positive feedback one receives the more positive one is likely to feel about oneself. The more negative reinforcement one receives the more likely that person will feel unworthy. In the early stages of ones life a greater percentage of time is spent at home and at school. Experiences in both these places very much influences ones development. Most people receive an equal balance of positive reinforcement from their home and school experience. However,for some, like the learning disabled child, negative feedback from ones school performance outweighs the positive feedback received from performance on non academic endeavors. Due to their underachievement in school they receive less positive reinforcement. Studies in which self academic concept of the learning disabled children is compared with non disabled children indicate that learning disabled children have more negative or lower self concepts (Boersma & Chapman,1979). These researchers also indicated that teachers hold lower achievement expectations for learning disabled children and that mothers of these children respond more negatively and less positively to their achievement behaviors

(Chapman, 1979).

Susan Harter suggests that positive reinforcement for independent behaviors leads to a diminished need for external approval. Eventually children develop an internalized self reward system that allows them to establish a feeling of self competence, (internal locus of control), develop intrinsic pleasure and increase motivation (intrinsically motivated). Lack of positive reinforcement for independent attempts with school tasks encourages dependence on adults and continual need for external approval (external locus of control). Consequently, a child develops a lack of self confidence in mastery situations which decreases motivation to do similar tasks by himself (extrinsically motivated)(Harter, 1978). Rotters theory of locus of control provides causal explanations which individuals construct for their success and failure. If a person has an external locus of control he perceives his reinforcements not entirely contingent on his behavior but on chance or under the control of powerful others (teachers). When someone is viewed as having internal locus of control he perceives reinforcement contingent upon his own behavior (Rotter, 1975). Learning disabled children tend to be externally rather than internally controlled (Pearl & Bryan 1979). Intrinsic and extrinsic motivation which was first studied by Hamlin and Nemo (1962) is very closely related to Rotters internal and external locus of control. If a child receives positive reinforcement for his achievement he will soon become confident in his ability (internal locus of control). Due to past successes, positive reinforcement and confidence he will become intrinsically motivated to do similar tasks. However, if a child receives more negative reinforcement for his attempts on independent tasks because of repeated failures (learning disabled) he will become less self confident of his abilities to perform similar tasks by himself and will seek approval from others. He will seek continual praise and reward to do tasks (extrinsically motivated). Perception of control can be seen as important consequences as well as mediators of ones' motivational orientation.

The above theories and research indicate an attitude of learned helplessness within the learning disabled. Not only do these children perform inadequately on academic tasks but they also feel that they can't do anything about it. They have little confidence in their ability to improve their skills. Teachers need to integrate academic and emotional remediation programs with learning disabled children because these children are failing in school and very often receive more negative than positive reinforcement which contributes to their feeling of helplessness and unworthiness. Research on motivational components of learning disabilities is important (Keogh, 1982), and when included in strategy designs it has been successful (Lovitt & Curtiss, 1969). External reinforcement should be initially instituted(Bandura & Perloff, 1976; Swittzky & Haywood, 1974), however, interventions should be employed that increase the individuals' ability to control his own outcomes (Bugantal, et al., 1980).

Essentially, educational programing needs to be responsible to the needs of the learner which requires individual assessment and instruction. Research that has investigated the academic performance of learning disabled children has significantly influenced an educational movement towards individualized programing.

Individual learner characteristics have been previously associated with influencing successful learning along with the activities that are provided by the instructor. According to Jenkins (1979) the nature of the material to be learned and the criteria necessary for task completion are also important factors and will be highlighted in the next section. The inherent characteristics of spelling and its' importance to accademic success influences the instructional approaches particularly in relationship to children with learning problems.

B. Characteristics and Importance of Spelling

The ability of an individual to express his/her ideas meaningfully and accurately significantly influences the effectiveness of his or her communication. Language is the most common method of expression. Words in speech or in writing convey meaningful messages that promote the understanding of ideas. As humans we share common languages that facilitate our communication with each other. Since writing is one of the two most effective means of communication it is viewed as a very important skill to master. The ability to write effectively and be clearly understood depends primarily on ones' cognitive processes and has been considered by some to be a reflection of a persons' intelligence, educational background and potential. It is crucial in the business world, social world, and academic world(Frask,1975). Inability to spell is frequently linked with illiteracy(Personkee & Yee,1971) and can sometimes affect an individuals' educational and occupational status (Graham & Miller,1979). Inadequate performance in spelling may lead to a lower self esteem which may be partly due to the historical notion that misspelling equates with slovenly habits, stupidity or laziness and even ill breeding(Rosenthal,1968).

Spelling performance is related to an individuals' ability in one or more of the required skills. These requirements include linguistic competence and/or knowledge about the language (Frith,1979), basic motor skills, degree of visual and auditory readiness (Carbonnell de Grompone, 1974), automatic recall of letter formation, a knowledge of letter sound relationships (Ako,1967), , discrimination, letter identity and sequence, memory and integration (Glusker, 1967). This is not an exhaustive list of required abilities, however, it represents some of the necessities for adequate spelling, and suggests some reasons why many people have difficulty with spelling.

The integrative complexities of cognitive and perceptual motor skills are not the only reasons for possible spelling weakness. Problems also emerge because the English language does not seem to follow consistent rules with respect to spelling. There seems to be as many exceptions as there are rules. The relation between spelling and spoken English can not be described simply in terms of sounds represented by letters (Schwartz & Doehring,1977), because spelling rules are governed with respect to the acquisition of morphological, phonological and orthographic patterns. Language doesn't seem to offer a good fit between written and spoken forms (Hendrickson, 1967) and for many people English orthography seems illogical and obsolete (Frith,1979).

Many events throughout history have influenced the relationship between spelling and sounds. Changes in English orthography were the result of many factors including military invasions, religious conversions, printers mistakes(Scragg,1974), language attitudes, political influences, phonological reconstructions from old English, influences of other languages like Latin and French and on the decision by scribes to make exception words visually dissimilar (Venezky,1976). Although spelling to sound exceptions can be explained by linguistic and historical grounds (see Baron,1981) the sometimes inconsistent grapheme-phoneme correspondences create problems for many spellers. These problems have spurred the creation of a spelling reform movement to make the spelling of words more consistent with the sound of words in order to make the written task easier to master. However, this orthographic change is considered by many people to have more disadvantages than advantages. It is argued that a more abstract system encourages children to look beyond simple grapheme-phoneme correspondences and develop the lexical and semantic aspects to reading (Smith,1980). Features of the orthographic structure aids in identifying morphemes and makes it easier to extract syntactic structure (Smith,1980). Linguists have stated that the abstract writing system represented by English orthography can express important linguistic relations that are missing from a more phonemic spelling (Chomsky & Halle,1968). It is also noted by some researchers that if all words had spelling to sound relationships then many words would be difficult to distinguish. Homophones like sea and see and exception words like "knife" and "psychic" would create problems in written expression (Baron,1981).

The debate on whether to introduce a new writing system or retain English orthography continues and our language structure appears resistant to change. However, inconsistencies with conventional spelling is not the only source of problems. Other reasons for spelling difficulty includes cultural background, lack of opportunity, retardation, poor teaching, emotional disturbance and neurological dysfunction.

C. Major Approaches to Spelling

The preceeding discussions reviewed the importance of spelling and some of the troublesome characteristics. It also indicated that spelling is not an easy task to learn and that many things have influenced our spelling performance and capacity for improvement. Spelling and reading are thought to be part of a highly complex information processing system (Gould,1976; Simon,1976). Eventhough research has not answered how we mentally manipulate expressive/receptive language and integrate it with visual motor production, we know that spelling can be learned and therefore taught. There is a lot of controversy about what factors most influence effective spelling and what procedures are best for instruction. However, most theories can be divided into three major view points.

One approach is to view English as a visual language and not a phonetic language. Some researchers that focus on this interpretation believe that successful spelling requires visual comparisons, recall or memory of visual representations of words and is dependent on many visual experiences (Hendrickson,1967). Due to the many inconsistencies in English orthography and because of the great number of spelling rules, the phonetic approach is seen as an encumberment (see Graham & Miller,1979). Others simply state that spellings are not phonetic but lexical

(Chomsky,1973) and that spelling should be thought of in terms of visual patterns (Tovey,1978). Hanna(1971) and Venezky (1967) point out that 75% of the words in the English language are redundant and because there are too many phonetic possibilities for many of the words, the best spelling approach would be to only study the most common words in our language. Studies done by Horn and Otto (1954), and Fitzgerald (1951) seem to support the approach in studying redundant words and suggest that a spelling vocabulary need not be larger than 30,000 words.

Another major viewpoint recommends the use of spelling rules and phonics to develop abilities in spelling. Many researchers (Block,1972; Schwartz & Doehring, 1977) suggest phonic instruction to be better then non phonetic approaches. Many theorists suggest that phonetic instruction benefits reading and implies its' usefulness to spelling as well. Bradley and Bryant (1982) state that phonological decoding skills are important determinants for reading success as does Mason (1978). Hogabaum and Perfetti (1978) report that speed naming of pronounceable non words clearly differentiates good and poor readers and Stonovich (1980) suggests that good readers have better phonetic segmentation skills. Spache (1940) and Gates (1937) demonstrated that most spelling mistakes were phonetic in nature.

A third perspective is that both visual processing and phonetic knowledge of English orthography are important in the acquisition and development of spelling abilities.

Baron, (1981) for instance, reported that good readers use both phonological and visual information in spelling and reading and seem to have some strategic control over the use of phonological information. Other research indicates the necessity of complete orthographic representation (Marsh,1980) and information about letter identity and sequence (Porpodas,1980). Porpodas comments in the number of years it takes to build up a useful storage of visual information. This suggests that effective spelling needs assistance from other processing capabilities like phonological encoding and decoding. Bradley and Bryant (1980) seem to support the dual hypothesis by stating that visual and phonological strategies come together in both reading and spelling. Many researchers seem to support the view that there is an overlap of operations in spelling tasks noting that spelling uses many sources including phonetic, graphemic, syntactic, morphemic, semantic and etymological (Smith,1980).

D. Reading and Spelling

Research indicates that spelling patterns may be functionally distinct from reading. The critical requirement for reading is the development of pattern recognizers which are responsive to visual characteristics of English words and spelling patterns. Spelling depends on permanent storage of letter identity and sequence (Porpodas,1980). Good readers are found to use visual and phonological information in reading and phonological information in spelling (Baron,1980). Boder (1971) found that retarded readers made different kinds of spelling errors than normal readers, however, this was later disproved by Holmes and Pepper (1977) who showed that the type of errors were not different. Saffron and Marin (1977) stated that phonological recoding is not necessary or sufficient for reading words in their study with aphasic patients. These patients lacked grapheme-phoneme conversion processes but were able to identify rhyming words, homophones and homophonic non words. However, for the early reader efficient grapheme/ phoneme processes do seem to be a major determinant of reading proficiency. Literature reporting on studies with people who have alexia indicate that individuals have certain amounts of flexability in using phonological recoding or visual mediation to get meaning from print. Apparently, either mechanism can be severely impaired while the other continues to function (McCusker,1981).

Poor readers may not have very good information about letter identities which seems to be critical in spelling exception words like 'debt' (Baron,1981). Low skilled readers tend to be more dependent on word shape as a source of automatic processing then high skilled subjects (Guttenag,1981) which supplements Perfetti and Hogaboams' (1975) finding that less skilled readers have less well developed automatic decoding skills.

Research on reading (Allington & Strange,1977; Allington,1978; Doehring,1976; Schaneveldt,et.al, 1977) suggest poor readers rely more on context for accuracy then for fluency or comprehension. Poor readers tend to have poor letter analysis mechanisms. Better readers have superior comprehension strategies. Good and poor readers seem to be differentially sensitive to letter patterns. This research suggests that more emphasis should be placed in developing graphic information within poor spellers. More practice in identifying spelling words in in written passages and studying spelling words in context of written expression and emphasizing meaningfulness may be appropriate strategies, rather than studying words in isolation that permit little generalization to their use and identity in reading.

It seems apparent from the preceeding research that both visual and phonological processes can work simultaneously as well as by themselves. The research also suggests that poor spellers need to strengthen their ability to identify and sequence letters and become more proficient at recognizing various orthographic patterns in English if their performance in spelling and reading is going to significantly improve. Generally, the research seems to support the dual process theory which is that eventhough reading and spelling may be functionally distinct they share common cognitive processes.

E. Spelling Processes

Research reports many individualized problems in spelling. Spelling errors tend to be in the middle of the word (Jenson,1962) and to be phonetic in nature (Spache, 1940). The primary difficulty for spellers seems to be the inconsistent rules for words that do not directly reflect speech sounds (Frith,1979) and because of the many phonetic possibilities for so many words in the English language (Valmont,1972). Lovitt (1975) supports this conjecture by simply stating that longer words are more difficult then shorter words. Some researchers report that almost onefifth of the spelling errors are due to the confusion over vowels and one half are due to insertion or omission of letters (Hildreth,1934). Good spellers seem to have more mastery in orthographic recognition (Perfetti & Hagaboam,1975; Schwartz & Doehring,1977) and possess more knowledge of letter sequences but not letter sound correspondence. Effective spelling depends on storage or memory of letter identity and sequence (Seymour,1980) and poor spellers appear to lack in storage capacity. Many people seem to have various degrees of spelling ability, for instance, Valmont (1972) states that people of all ages do not seem to be able to detect spelling errors, therefore the concern is in the degree of weakness not the fact that people make errors. Poor spellers seem to have less automatic decoding skills (Perfetti & Hogaboam,1975) and less ability in letter sound correspondence (Guthrie & Siefert,1977). In general, children have a phonetic base but lack knowledge of lexical spelling (Tovey,1978).

Research suggests that young children start by using phonetic encoding strategies, they later develop encoding strategies that relate to spelling rules, such as the long vowel rule and then finally adopt a strategy of spelling unknown words by analogy to the spelling of already known words (Marsh,1980). Abstraction of general spelling patterns promotes better spelling and reading (Gibson, 1965) and the skill is usually evident when children can spell nonsense words that are not usually taught (Schwartz,1977). Since poor spellers seem to have fewer words in memory storage than good spellers and have less ability in letter sound correspondence, then their ability to make analogies from unknown words to words in memory storage would also be less effective. Spelling aquisition involves much more than short term memory for words. Abstraction from general patterns seems very important to ones' spelling, reading and verbal potential.

Although the preceding research review is not exhaustive and a more in depth analysis of spelling difficulty is available in the literature on the processes in spelling (see Frith, 1980) it is representative of some of the major findings. Once teachers are aware of how children learn to spell and what some of the inherent problems are with respect to spelling, then they will be more prepared to be responsible to an individuals' needs.

F. Spelling Instruction

Spelling instruction is usually oriented to a large group. Many children benefit from this procedure however, there are many who need individualized instruction because they don't seem to learn at the same rate. The traditional method of classroom instruction involves the utilization of published material which is produced by a large number of companies but essentially the same in content. Cohen (1969) (see Graham & Miller,1979) found that some of the exercises in commercial materials actually deterred learning while others were merely ineffectual. 'Evidence reveals that instructional practices in spelling are influenced more by habit than by research' (Graham & Miller,1979). Typical exercises include word lists to be studied, disecting of words, word comparisons, sentence completion with studied words and games such as word puzzles. The children are usually expected to proceed through the exercises on their own with periodic evaluation from the teacher. The teacher usually supplements these exercises with related information and then concludes the particular segment with unit tests.

Traditional spelling programs are teacher instructed, directed and rewarded. Everything is usually given to the child and may or may not be particularly relevant to his or her needs. If the child completes the assignments, successfully parrots the teacher and basically meets the expectations of teacher and published materials then the requirements of the program are accomplished. If the child does not satisfy the requirements they are encouraged to repeat the same or comparable program. There seems to be a common opinion among teachers that their programs are inefficient. Nevertheless, they are still being used. This concern is supported by research that suggests spelling achievement is lower then it was 30 or 40 years ago (Horn, 1960). Unfortunately, there is a very limited amount of material on effective spelling strategies especially as it relates to differences in individual capabilities. Presently, there seems to be less research in spelling generally compared to the amount available between 1925 and 1965.

Research suggests that spelling programs should focus on the individual rather than the group because of the variety of differences in ability (Allan & Aeger, 1965; Stowitscheck & Jobes, 1977). The ways a child processes information and attempts to spell along with strengths and weaknesses in ability should be examined before designing a spelling program. The strategy should be easy to understand and allow for consistent and confident useage. Children should be informed on the meaningfulness of spelling and its' importance with respect to present and future needs. Some researchers seem to support this idea by recommending that a 'spelling consciousness' be promoted (Hillerich, 1977; Guthrie & Siefert, 1977) and that children be given purpose to their study (Graves, 1976).

Some researchers indicate that spelling instructions are often ambiguous and that spelling performance may be a function of teacher behavior (Stowitscheck & Jobes, 1977) and that just giving clear instructions is sometimes all that is needed to influence spelling ability (Rosenthal, 1968). Other studies suggest that modeling the childs' strategy for spelling and providing consistent reinforcement will improve performance (Lovitt, 1975; Benowitz & Busse, 1976; Dietrich, 1973).

Aho (1967) suggests that since spelling requires automatic recall of letter sequences and formations with respect to letter sound correspondence, the child should be taught the sounds of various vowel and consonant combinations and practice them in meaningful ways. One approach would be to employ words in sentences which would develop purpose in spelling and facilitate memory of words. He, along with others (Rudman, 1973) believe that remembering words out of context defeats the purpose of writing and only strengthens short term memory of words. This perspective is shared with others (Frith, 1979) who considers that learning to spell is a matter of acquiring knowledge and that the child should be given the opportunity to manipulate words so that the relationship between spelling, meaning and phonology becomes clear. Cohen (1969), (see Graves, 1976) indicates agreement with this view when he concluded from his study that better spelling comes when children use language with a purpose. Other research states that matching words with experiences makes spelling more meaningful and can improve performance (Hendrickson, 1967). Meaningfulness should be stressed and emphasis on memory for words out of context reduced (Rudman,1973).

Some researchers stress the need for revitalizing interest in spelling (Monson, 1975), encouraging pride and promoting positive attitudes (Graham & Miller,1979). These authors do not ignore the functional aspects of spelling but seem to suggest that along with examining the processes of spelling there should be some evaluation and consideration of the childs' feelings, attitudes and self-concept.

Some indicated in a previous section that one skill that seems to separate good spellers from poor spellers is the ability to abstract general orthographic patterns. Good spellers seem to have more mastery in orthograhic patterns (Gibson,1965). This suggests that exercises which strengthen abstract generalization and conceptualization ability should be encouraged, as Chomsky (1970) stated, spelling should be analyzed with meaning in mind.

Many spellings are not phonetic but lexical in nature. Lexical spellings are not based on perfect one to one sound letter relationships but are in accord with pattern sequences of letters in English orthography (Chomsky,1973). Tovey (1978) indicates that spelling should be thought of in terms of visual patterns rather than sounds and that children be conditioned to spell this way because lexical patterns cannot be produced solely by sounding them out.

Some researchers report that good spellers have more mastery in orthographic recognition (Calfree, et. al.,1972) and that good readers produce more correct pronounciations of artificial words that have predictable orthographic correspondences (Perfetti & Hogaboam,1975). This research suggests that word recognition skills differentiates spelling ability and should be developed.

Guthrie and Seifert (1977) compared good and poor readers and concluded that they may deviate from each other in their ability to learn letter sound correspondences. Other studies suggest that children be taught spelling phonetically, especially those who have inadequate memory abilities (Vellentino, 1975) and slow decoding skills (Perfetti & Hogaboam,1975). These studies suggest that children be taught to identify words according to categories that are organized with respect to the application of rules and that they practice these words to perfection before advancing to more complicated structures. Support for this strategy comes from research recommending sorting of words in list categories on the basis of meaningful similarities in order to promote incidental recall (Mandler, 1967). Children might be well advised to learn basic rules before moving on to more complex rules. For instance, children should learn the short vowel rule before learning rules that apply to words with long vowels.

Some researchers recommend modeling of academic tasks to be a highly effective technique with some children

(Kauffman et al,1978). Lovitt (1975) also recommends modeling along with imitation of errors and praise. There is a lot of controversy in the literature on whether children should imitate their errors. Thomas (1979) recommends the charting of spelling errors in his instructional handbook and it seems to be successful with a number of children.

Rehearsal strategies are viewed as important in developing spelling ability because eventhough most children use the strategy to some degree (Mann,et al., 1980) poor spellers seem to have less ability in recalling letters and word strings (Bauer,1977), or in some cases may be rehearsing badly encoded information (Mann,et al., 1980).

Many words require integration of orthographic and phonological information in order to be spelled correctly, like pseudowords (Glushko,1979). Some words have too many phonetic possibilities to use letter sound correspondence strategies (Hillerick,1977) and storing visual representations of words may be useful and adequate for reading but spelling requires more attention to individual letters (Stanovich,1980). Eventhough word shape does seem to be a source of automatic word processing in reading (Guttenag; 1981) its' relevance to spelling is still questionable. Nevertheless, some researchers believe identity of letters and visual form is used in word perception and can influence its' process. Therefore, it should be considered when developing strategies for spelling (McClelland,1976).

Many researchers stress the development of phonological skills and many others stress the importance of ability to use orthographic information towards spelling efficiency. Although the controversy continues over which one is more important, Bradley and Bryant (1982) seem to clear up the confusion in some minds when they state that visual and phonological strategies come together in both reading and spelling.

Some general procedures that seem to be supported by research include the test study method rather than the study test method (Yee,1969), have students correct their own work (Schoephoerster,1962) and make spelling interesting and fun (Horn,1969; Monson,1975). Three popular and well supported methods of study include the Fitzgerald method (Fitzgerald,1951), the Horn method (Horn,1954) and the cover and write method (see Graham & Miller,1980). The cover and write method is widely advocated however, the recommended procedure is not very often presented to the students:

1. Look at the word and say it out loud
2. Cover the word and imagine what it looks like
3. Write the word down without looking
4. Compare the word that has been written with the correct spelling. If the word is misspelled try again steps (1-3).

A central element of the preceeding design involves mental imagery. Imagery strategies along with motor activity (writing the word) has been employed by many researchers

(Caban,et al., 1978; Cardoni,1981; Forest,1981; Levin,1975; Rowe & Paivio,1971) and has been reported as a successful technique.

Caban (1978) tested the hypothesis that spelling words can be better learned and retained by using a mental imagery approach compared to a 'drill and practice' method or a 'no direction' procedure. The eighth grade students in the experimental group traced their spelling words on a 'magic slate' apparatus which was comparable to an apaque sheet overlying carbon paper. The students were instructed to take each spelling word and form a mental picture of it reproducing the words on the slate with the correct spelling of the word in their view. The students were then instructed to check the spelling, erase the slate, and repeat this process five times. The group receiving the spelling instruction using a mental imagery approach scored higher then the control groups on both the spelling test administered immediately after instruction and on a test administered seven days after instruction.

Forrest (1981) defines imagery as a form of mental action that is basically a reconstruction. He reports that there is no single and reliable test for visual imagery and that most clinicians infer its' precense from visual memory tests. An informal method sometimes used is to ask the individual to close his/her eyes and try to cojure up specific images, and if this can be done, then try to shift the image around or change its' colour or content. If visual imagery is found to be present, the individual can be taught to utilize this strategy in doing those particular tasks in which imagery would be useful. Forest describes a method for teaching a child with a learning disability in spelling to use visual imagery as a strategy for learning to spell. "The child is first requested to conjure up a mental picture of something to write on such as a chalkboard, writing paper, semi hard cement or a sandbox. He is then asked to visualize himself, with his eyes closed, writing the letters of a word as they are being called off to him. He is instructed to try to retain the image of these letters but report if they fade. If they fade, the letters are to be repeated. If he is able to image the whole word in his mind, he is asked to call off the letters backwards, 'fast'. This is to verify that the entire word has been imaged. If this is accomplished, then at different intervals during the day he can be asked to go back in his mind, see the word, and call off the letters either forwards or backwards. If at this later time he is not able to conjure up the image of the word, the original procedure is repeated. The purpose of this procedure is to train the child in the use of a new strategy, that of conjuring up, recalling and trusting images of specific aspects of written language. The imagery approach gets to the core strategy in visual information processing and teaches the child how to use the strategy in order to enhance his overall performance capability and to circumvent a persistent auditory-verbal processing problem.

In effect the child is shown how to become a true partner in the process of helping himself to learn" (Forest,1981,p.586).

Durrel (1980) and Bradley (1981) are other researchers who seem to recommend a visual imagery approach that is incorporated with motoric actions. However, these researchers emphasize the importance of letter identity in spelling and the usefulness of sounding out loud the letter names of spelling words as they are being written.

Durrel (1980) believes letter names are essential for teaching pre-reading phonics and for making the child aware of the sounds in spoken words. Sounding out letter names develops a relationship of sounds to letters along with being an aid to word analysis where spelling seems to work much better then sounding. He indicates that saying the letters in the printed words bears some relationship to the sounds of the spoken word and creates a semantic relationship that helps to pronounce words regardless of the orthographic oddities. Letter names essentially carry out an effective phonetic service that enables children to move smoothly from speaking to reading to writing.

Bradley (1981) reported that the 'Simultaneous Oral Spelling' approach which establishes a one to one relationship between the spoken word and the written symbol as a child names each letter as he/she writes it proved to be a successful method of teaching spelling. When using this method the child is learning to label, discriminate, recall, organize and analyze spelling words through a multisensory approach. The visual and auditory modalities are linked through writing. She argues that the results of her study demonstrate that the ability to spell correctly is dependent upon the correct motor patterns for writing the words.

Quorn (1981) cites some characteristics of an effective spelling program that was researched by Fitzsimmons and Loomer (1977) and supported by multiple, independently conducted research programs. They include:

1. Children should learn how to spell only words which they are familiar in meaning and pronounciation. Children should not be expected to learn meaning pronounciation and spelling simultaneously.
2. Children should only learn how to spell words that are causing them difficulty.
3. Self correction by the learner is the single most influential variable affecting learning to spell.
4. Teaching phonic generalizations is highly questionable and should only be taught when they have a wide applicability(Horn,1969).

For many years education primarily focused on the development of the average child. Schooling involved grouping of children, placing them in appropriate classrooms, giving them curriculum that met their general needs and instructing them as a group. Teachers usually structured lessons for a group of students not for each individual student. Due to the large number of children who required schooling, the cost of education and the assumption that there was no need for change; individualized instruction never seemed possible or necessary. Consequently, children who could not maintain average performance very often fell by the wayside. They were often considered not suited for academic study. Many of these children were improperly assessed. Within recent years research has discovered that many children who are underachieving may under certain circumstances attain more academic success than previously thought possible. Educators began to be more attentive to the fact that not all people are the same and that some specialized help should be given to those who are having trouble. Individualized instruction is not an easy task because it requires special knowledge skills and involvement. The teacher must try to realize the childs' emotional needs along with his or her abilities before programs can be designed.

Research indicates that spelling is one area that many children require individualized instruction. Therefore, group method designs are very often inappropriate.

The above spelling review reinforces the view that spelling is not an easy task to master. Learning the skill is confounded by the fact that there are many processes involved and spelling to sound rules do not always correspond with English orthography. The reasons for spelling difficulty are numerous and the solutions are very often controversial. Nevertheless, spelling is an important skill to master and is essential for accurate communication in writing.

Before any spelling program is initiated a thorough assessment of the childs' strengths, weaknesses, capabilities, motivation, potential, background and skills should be conducted. Ultimately, a program that caters to an individuals' needs and allows him/her to improve his/her spelling skills and ability along with being rewarding, successful and generalizable to a number of students would be appropriate.

Presently, spelling instruction appears to be guided by two major orientations: the 'Traditional' approach and the 'Direct' approach (Smith,1981). Both of these orientations posit a need for individualized spelling assessment with students, however, the training devices are different.

The traditional approach usually involves the use of a provincially approved spelling program such as 'Spelling in Language Arts' (Nelson,1963,1976). This publication is popular among many of the teachers in the Edmonton,Alberta area and is used in many core classrooms as well as in special education classrooms (Edmonton Public School Board).

These programs are usually organized to accomodate various levels of spelling achievement. The words are usually chosen from a recognized list of common words such as the 'Dolch' list which is oriented for students in elementary education. Instruction is primarily aimed towards a large group, however, is often used in individualized programing. Generally, the exercises contained in these publications include word lists to be studied, word comparisons (for example, synonyms and antonyms), identification of root words, prefixes and suffixes, searching for definitions, sentence completions and review sections. Some publications, for instance, 'Spelling in Language Arts' emphasize the 'look, spell and check' method for studying problem words but do not consistantly institute this procedure throughout the booklet.

The typical approach in using a spelling series is to assess the students' level of abitity in accordance with the words used in the publication then place the student at the particular level of spelling activities that is appropriate for his/her spelling achievement. The children are usually expected to proceed through the exercises on their own with periodic instruction, assisstance and evaluation from the teacher. The teacher usually supplements these exercises with related information and concludes the particular exercise segment with a unit test.

Direct instruction usually involves teaching of specific skills. This method requires careful consideration of the students' skills and potential, evaluation of the learning enviroment and a detailed analysis and construction of the program. Direct instruction has been successful in a variety of situations with disadvantaged students (Baine, 1983) and has growing support from teachers of special students and core classrooms.

Essentially, all skills are taught directly by the teacher after careful evaluation of the students' strengths and weaknesses. The teacher is responsible for presenting information to the learner and providing feedback contingent on the learners' responses. For instance, in the area of spelling, if the learner is not succeeding it is the responsibility of the teacher to change the process in accordance with the difficulty.

Teachers often evaluate students' skill level by using criterion reference tests and then create an individualized educational program or use published material that is appropriate for the students' difficulty. Examples of well established direct instruction approaches include Morphographic Spelling (Dixon & Engleman,1976) and the Distar Spelling Program (Engleman & Bruner,1975).

Another orientation is a self-instructional approach. However, it is seldom used due to the difficulty of teachers to find release time in order to create individualized self-instructional packages for their students (Smith,1981). Nevertheless, when self-instructional formats have been utilized some researchers have reported positive results in handwriting (Kosiewicz,et al.,1979), arithmetic (Hallahan, et al.,1979) and reading (Hallahan,et.al.,1979).

The self-instructional orientation is based on a cognitive approach that stresses the contribution the learner makes to his/her own learning and focuses on child-centred instructional strategies (Markman, 1977).

Interest in this technique has grown due to the recognition that learning involves an interaction between the characteristics of the learner and the learning activities.

The swing toward cognitive approaches to the study of learning disabilities has been influenced by psychology and education. The definition of cognition which is derived from information processing theory (Hresko & Reid, 1981) entails the study of how people go beyond the information given (Bruner, 1973).

G. Cognitive Processes and Training

Two major factors in cognitive development are the aquisition of strategies and the awareness of cognitive functioning (Paris & Lindaur, 1976). "Cognitive processes can be broadly defined as those higher order mental abilities that pertain to thinking, understanding and perceiving" (Finch & Spirito, 1980, p. 31).

Interest in processes and its' relationship to education, as was mentioned previously, came from information processing theory and computer technology (Loftus & Loftus, 1976) resulting in the recognition of the learner as being the most important element in a teaching/learning situation (Ausubel, Novak & Hanesian, 1978, Wittrock, 1978). This focus has influenced education especially with respect to the methods used by learning disabled children in a learning situation and in the construction of instructional programs (Hall, 1980, Torgessen,1977, Wong, 1979). Some researchers believe that ability deficits alone cannot adequately explain the performance of children with learning problems (Wong,1982-83), hence, the concept of "metacognition" has generated much interest among developmental and cognitive psychologists particularly with respect to learning disabilities (Hresko & Reid, 1981).

Metacognition (see Brown,1980,Flavell,1976) generally refers to a persons' conscious attempts to control his/her remembering, comprehending, attention and general or specific processing of information (Brown & Smiley, 1978) on academic tasks by employing skills (strategies) that among others include predicting, checking and monitoring of performance. Metacognition can also be viewed as ones' ability to monitor ones' own cognition or to think about thinking (Babbs & Moe,1983). Flavell (1976) suggests that metacognition includes knowing that one is having difficulty with particular aspects of learning, knowing that self-checking is important in writing assignments and knowing that examining all the alternatives to a problem will result in a more accurate or appropriate response. Brown (1978) compares these concerns with the common educational term 'study skills'.

Cognition and metacognition effect ones' performance across many domains (see Figure 1, Appendix B). Cognition is the intellectual functioning of the mind that is characterized by remembering, comprehending, focusing and attending. Metacognition is knowledge or awareness about ones' cognition. The two major dimensions of metacognition are (a) the reflection of cognitive processes and (b) the control of cognitive processes.

Reflection is the introspective dimension that involves knowing about ones' cognitive activity (Metacognitive Knowledge). Generally, it is "the how of my action". Furthermore, it is domain and task specific along with being conscious and reportable.

The control of cognitive processes is an executive dimension (Executive Processes) that regulates how one accomplishes the act of remembering, comprehending and attending. This involves devices such as planning, monitoring and checking which can also be conscious and reportable. Taken together, metacognition can be viewed as knowledge about cognition and the regulation of cognition.

When applied to a particular task, metacognition allows for the development and employment of strategies to occur. Strategies are mechanisms, rules or specific behaviors that enable the individual to complete a task or solve a problem in a means end fashion. They result from ones' reflection about the task and knowledge about the task along with being influenced by ones' repertoire and experience with respect to executive processes.

For some individuals, it appears that successful performance can be achieved without cognitive reflection and/or regulation. This is an example of automaticity.

People who do not appear to use metacognition are viewed as efficient problem solvers or "experts" with the particular task. Due to their successful experiences with the domain specific requirements, they no longer reflect on or regulate their processes. However, it is assumed that they once employed metacognitive dimensions and would again if presented with a novel situation.

When applied to the act of spelling a metacognitive orientation would suggest that the speller would reflect upon the specific domain (spelling) and the task (studying spelling words) and think about how one is going to proceed. Next, strategies evolving from ones' executive processing would be searched and selected that would be appropriate for the demands of the spelling task.

The study of metacognition is important because it can provide some insight on why children choose some strategies over others. Studies in the field of cognitive psychology have shown increasing interest in the hypothesis that learning can be enhanced by employing task-appropriate strategies (Belmont & Butterfield, 1971, Flavell, 1970, Hagen, 1971, Hall, 1970, Hallahan & Kneedler, 1979, Henker, Whalen & Hinshaw, 1980, Keogh & Glover, 1980, Liberty & Orstein, 1973, Lloyd, 1980, McKinney & Haskins, 1980, Meichenbaum, 1980, O'Leary, 1980, Rohwer, 1978). The employment of strategies with children is highly related to training procedures that are facilitated by the instructor and adapted by the learner.

Keogh and Glover (1980) indicate that there are a variety of methods and techniques used in cognitive training which creates a lack of definitional precision. However, a review of the cognitive training programs used by researchers (Denny, 1972, Meichenbaum & Goodman, 1971, Yando & Kagan, 1968) suggests that in differing degrees most incorporate aspects of modelling, verbal self-instruction and self-reinforcement. Cognitive training implements a task analytic approach whereby the child is taught appropriate task relevant cognitions or cognitive strategies which interupt or inhibit maladaptive stimulus response associations (Abikoff,1979). Like most new therapeutic interventions the development and use of cognitive treatment procedures has occured partially in response to the limitations of clinical interventions commonly used with children (Abikoff,1979). These limitations include the reduced benefits from treatment when reinforcement contingencies are used with children who have behavior problems. When the children are removed from the controlled and monitored situation their maladaptive behavior often becomes re-established in their natural enviroment (Kratochwell,1978). Similarily, when stimulant medication is withdrawn from hyperactive children there is a return to pre-treatment conduct (Douglas,1975). Some researchers, however, have used cognitive training procedures as an alternative to operant procedures and medication and have reported maintenance of desired behaviors (Bornstein &

Quevillon, 1976).

Cognitive behavioral interventions is not a new exotic therapy. Rather it is a purposeful attempt to preserve the demonstrated influences of behavior modification within a less doctrinaire context and to incorporate the activities of the client in the efforts to produce therapeutic change (Kendall & Holland,1979). Cognitive training presupposes that a persons' behavior is controlled by cognitive strategies (Gagne,1977) and that people learn facilitative strategies to deal with tasks. After a learner analyzes the task requirements he/she will recall or construct strategies that will satisfy the demands of the task (Dansereau,1974). This requires knowledge of effective strategies and/or the ability to construct strategies along with the capacity to discern what the most appropriate strategy would be to employ within the context of a situation (Brown & Campione,1977) This is all related to metacognitive awareness (Brown, 1980).

Successful learning performance requires both an analytic cognitive style and the availability of strategies to be employed for the particular task demand. Cognitive training is a treatment approach that aims at providing an effective strategic approach to improve task performance (Ledwidge,1978). Essentially, cognitive training teaches individuals how to think just as educators would teach how to do other skills (Loper,et al.,1980). It attempts to modify a persons' pattern of thought with respect to completing a task requirement so that the individual has both a skill and a plan for successful performance.

One approach that has been successful in developing problem solving skills is cognitive behavior modification (CBM). CBM is cognitive therapy with a behavioral twist. The CBM therapist does not modify cognitions, he deals with internalized speech" (Ledwidge, 1978,pg. 356). Where as behavior therapists attempt to change behavior directly by using mainly non verbal means, cognitive therapists, attempt to change behavior by influencing the clients' pattern of thought and rely chiefly on speech as the instrument of change" (Ledwidge, 1978,pg. 356). The primary focus of CBM is thought processes.

Cognitive modification combines the successful techniques of behavior therapy with those of cognitive therapy into an approach using the persons' inner speech as a means of guiding behavior. A basic premise of this approach is that cognitions (of which inner speech is one aspect) influence behavior, therefor by changing cognitions, behavior can be changed. Essentially inner speech is viewed as behavior subject to the same principles of learning as overt behavior'(Smith,1981, p. 136).

CBM training involves a self-instructional strategy that allows students to act as their own trainers or teachers. Its' importance and effectiveness is supported by many researchers (Denny,1972, Meichenbaum & Goodman,1971, Yando & Kagan,1968). CBM encourages active participation and self reinforcement along with providing for external reinforcement. It is a problem solving process for children with inefficient learning strategies that requires the child to self-instruct, self-reinforce, self-assess and self-record (Lloyd,1980).

Research indicates that performance deficiencies of many learning disabled children may be accounted for by their failure to employ efficient task strategies (Hall,1978, Hallahan, Kaufman & Ball,1976, Havertape & Kass, 1978, Torgessen, 1977,1980).

In order for a child to do well on an academic task he must know what is being asked of him, know a good way to proceed with the task, have the skills necessary to do the task and feel confident in his ability. Learning disabled children can perform as well as normally achieving children if taught to use appropriate recall, retrieval or rehearsal stategies in solving the problem(Hall,1978). Torgesen suggests that if early failure in school leads learning disabled children to become less involved in trying to meet the demands of curriculum that has outdistanced them, their school experience would not stimulate the development of strategic learning behavior to the same extent as a normal child (Torgesen,1980).

An effective problem solving strategy must focus on a particular weakness, be easily understood and allow for consistent and confident usage. Its' benefits should be conceptualized and self-rewarding. According to Ken

Weber(1974),you must awaken an interest in the mind of the turned off. Research indicates that children must participate actively in the learning process for it to be self-rewarding (Henker,et. al., 1980) and that failure in some tasks by learning disabled children is due to not approaching tasks in a planful, organized and active way (Torgesen,1977). Some learning disabled children are passive learners and do not use active strategies (Hall,1980, Havertape & Kass,1978, Kaughman & Hallahan,1979, Lloyd, 1980, Loper,1980). However, research indicates that CBM shows potential for inducing confidence in the ability to do a task allowing for selfsatisfaction independent of others and in maintaining and transfering the ability to do the particular task (Bornstein & Quevillon,1976, Brown & Barclay,1976, Kramer,1980, Keogh & Barkett,1979).

Self-instruction as a major component of CBM is an important device because acting independently in todays' society is expected (O'Leary & Dubey,1979). It involves teaching the child specific verbalizations that follow a step by step sequence. Self-verbalizations contribute to the childs' cognitive style(Meichenbaum & Goodman 1971) improves word reading (Lloyd ,1980) and has produced dramatic increases of attention and performance over baseline procedures(Meichenbaum & Goodman,1971; Rosenbaum & Drabman,1979).

Numerous psychologists and theorists have indicated that inner cognition or inner speech influences behavior

(Bandura,1976, Luria,1961, Furth,1968). Furths' basic assumption is that thinking is reduced to language, language is reduced to inner language, and inner language is conditioning(Furth,1968). CBM assists children in "developing overt self-regulatory speech which later becomes covert and guides behavior on academic tasks more effectively"(Smith,1981,p.137). Experimental research done by Lurias and Yudovich 1959, provides evidence that supports the neccessity of speech in the development of thinking (Furth,1968). Essentially, thinking is related to language. We can influence a persons' thinking with language. Information becomes internalized by means of repitition and rehearsal. It is stored and then available for use.

Research has shown that some readers show deficiency in the use of verbal rehearsal as compared to normal readers (Torgesen & Goodman, 1977) and that children with learning disabilities recall less information on memory tasks due to lack of efficient rehearsal use (Belmont & Butterfield, 1971, Swanson,1979). Word reading can improve by using a self verbalization strategy (Kneedler,1980; Lloyd, 1980) and rather than interfering with the problem solving process can instead be facilitative (Havertape & Kass,1978).

If we accept the assumptions that learning disabled students have lower academic selfconcept than non-disabled students. That a lower perception of ability in academic tasks can influence their self-image and motivational orientation in a negative way so that they feel less adequate to attempt tasks independently with self-confidence. That they are passive learners rather than active learners. That their underachievement is very often confounded by their inability to acquire respect from significant others. Then, a remedial design that attempts to alleviate these factors would seem appropriate.

In order for cognitive modification to be effective in problem solving situations it must allow for the individuals' active participation, self instruction, self reinforcement along with external reinforcement, explanations on the purpose of the procedure, good communication between facilitator and client, flexability in the design, self verbalization and modelling of the technique. Several researchers (Abikoff,1979; Kauffman & Hallahan,1979; Keogh and Barkett, 1979; Keogh and Glover,1980; Lloyd, 1980; Mahoney,1974; Meichenbaum,1977) have suggested that cognitive modification procedures offer particular promise as a way to remediate the academic and behavioral problems of children with learning disabilities. Some researchers have found that when cognitive modification was compared to medication and behavior modification it showed the greatest possibility of transfer or generalization (Keogh & Barkett,1979; Keogh & Glover,1980).

Modelling is essential in cognitive modification. It is the primary means of instruction (Lloyd,1980). Students act as their own therapists or trainers and are encouraged to control, assess and positively reinforce their efforts.

However, before remediation can be initiated an accurate assessment of the problem must be done. One of the most emphasized and probably most complimentary aspects of the CBM technique is the consultation part of the assessment. It is during these early stages that both the client and facilitator attempt to discover the reasons for the problem. The intent is to discover how the individual processes information, how the individual tries to solve the problem and how he/she feels about his/her efforts. A unique aspect of the CBM design is that both the client and facilitator work together toward the solution. The client becomes an active participant. Another important feature of the CBM design is that it is flexible. If a certain procedure is not effective for the individual then both facilitator and client examine the reasons and submit alternative strategies. CBM is one approach that offers the individual the opportunity to develop strategies that are particularly relevant to his or her needs. It is an intervention approach that attempts to modify cognitive strategies in relationship with task performance.

Many of the components of CBM have characteristics that are similar to the metacognitive orientation (see Figure 2, Appendix B). CBM is like metacognition because both conceptualizations are concerned with thought processes, specifically in relation to attention, perception and language. Both orientations are interested in strategy employment in connection with task and person variables along with believing that performance may be influenced by poorly organized cognitions. Furthermore, advocates of CBM and metacognition recognize the contribution the learner makes to the learning process.

The two conceptual frameworks from which CBM and metacognition has been applied to children with learning problems is Torgesens' (1977) "inactive learner" and Adelmans' (1971) interactional model. These two concepts respectively suggest that some children develop a passive or unorganized style to learning and that learning deficits may be the result of a mismatch between instruction and cognitive awareness (metacognition)

Torgesen indicates that a learning disabled childs' inability to use efficient problem solving strategies is a major causitive factor in the childs' difficulty with solving academic problems. Further, he suggests that the cognitive processes of these children can be inferred from exploring the strategies used by learning disabled children (Torgesen,1982) which can aid in the remedial prescriptions for these children. Wong (1982-83) criticizes this conceptual framework by suggesting that this theory is based on underlying mechanisms which can not be observed and that the conditions which learning disabled children exhibit strategies are difficult to access and measure. However, the conceptual model is promising because it allows researchers to provide conditions under which learning disabled students may demonstrate strategies (Wong,1982-83). Then explore the interactions between the learning disableds' knowledge of various task parameters such as 'studying for spelling' and their performance on the task (spelling test).

Adelman (1971) conceptualized the development of learning disabilities as a result of a mismatch between the instructional environment and the childs' cognitive problems. He hypothesized that if the instructional environment was "personalized" to accomodate the childs' processing problems their skill deficiencies would be minimized. However, Wong (1982-83) states that he does not operationally define "personalized" which could lead to different interpretations from the various professionals responsible for implementing remediation for learning disabled students. As Wong (1982-83) suggests, if personalized instruction was defined in terms of "interactions between the teachers' direct training of learning disabled students to engage in particular learning strategies/ activities or structuring materials/ exercises, and the learning disabled students' knowledge, processing problems and/or skill deficiencies (p.16) it may lead to testable hypotheses. For example, manipulating teaching approaches with respect to spelling instruction.

H. Metacognition And Spelling

When metacognition is applied to spelling it can be viewed as a sequence that begins with the spellers' metacognitive knowledge and ends with the use of strategic spelling behaviors. The following example is based on Flavells' (1979) model of cognitive monitoring in reading comprehension but modified to fit spelling. The skills and strategies included in this example are based on principles derived from the research (see "Literature Review on Spelling") with respect to effective spelling skills relative to studying and performance. They are labelled as metacognitive skills because they can be consciously evoked by the speller focusing on the important content in monitoring spelling performance, in determining success in reaching goals and in resolving breakdowns in spelling. "The value of viewing these skills within a metacognitive framework lies in the increased emphasis on the spellers responsibility for this knowledge and control and on the teachers' role in developing success and ability (Babbs and Moe, 1983).

Metacognition and the Spelling-Study Process

This outline is based on the figure presented in Babbs and Moes' article on "Metacognition"(1983, pg 422). In terms of the description of metacognition presented earlier (see Figure 1, Appendix B), points 1,2 and 3 represents the "metacognitive knowledge" dimension of metacognition. During this phase the speller reflects upon the domain specific task (spelling) and contemplates the "how of his action". Points 4 and 5 represent the "executive process" aspect of metacognition. The speller establishes a method to accomplish the specific task (spelling) and searches for task appropriate strategies to control and regulate the successful completion of the task.

1. The speller consciously intends to control the spelling study act (metacognitive experience).
2. the speller establishes the goal for the spelling act.
3. The speller focuses on his/her metacognitive knowledge (metacognitive experience).
   - A) Knowledge of his/her own cognitive processes
   - B) Knowledge of the demands imposed by the spelling task.
4. The speller strategically plans the regulation and monitoring of the spelling act.
   - A) Consideration of the metacognitive skills and strategies.

Example: Looking at the spelling word
Memorizing and visualizing the word
Phonetic analysis
Morphological structure of the word
Looking for orthographic irregularities of the word
Looking for letter sound correspondence
Examining word parts, for example, consonant blends, digraphs and dipthongs
Testing ones' understanding
Identifying pattern of word

Writing the word

Checking the writing performance with the correct spelling

Examining letter sequences

Mentally executing steps involved in efficient spelling study

Relating new knowledge to prior knowledge

B) Selection of metacognitive skills and strategies

C) Implementation of the skills and strategies

5. Periodic assessment of spelling study success while working through the required list of spelling words to learn (metacognitive experience).

As Babbs and Moe (1983) suggests , the major focus of instruction in metacognition is to teach students to use knowledge about the spelling task independently and to plan, regulate and monitor their spelling/thinking activities.

I. CBM and Metacognition

An objective with CBM is to provide children with a knowledge or meta strategies of when and where a specific strategy will or will not work (Meichenbaum, 1980).

Metacognitive development is the aquisition of knowledge and cognition about cognitive development(Meichenbaum,1979). As Anne Brown stated,it is knowing about knowing. Flavell and Wellman (1977) define metamemory as an individuals' knowledge about anything germane to information storage and retrieval. Metacognitive development refers to "the ability to stop and think before attempting a problem, to ask questions of oneself and others, to determine if one recognizes the problem, to check solutions against reality by asking not 'is it right' but is it reasonable, to monitor attempts to learn to see if they are working or worth the effort" (Brown,et al.,1977, pg.1456). Metacognitive development is concerned with 'executive processes' (Belmont & Butterfield, 1977) or what Gagne and Briggs (1974) calls 'cognitive strategies'.

A cognitive strategy is a skill by which the learner manages his own thinking behavior. "Cognitive strategies have as their objects the learners own thought processes. Undoubtedly, the efficacy of an individuals' cognitive strategies exert a crucial effect upon the quality of his own thought" (Meichenbaum, 1979,pg. 29). The elements of metacognitive processes and the content of self statements that have been used by CBM therapists are quite similar.

Work on metacognitive development with mentally retarded children has suggested that a control aspect underlying inadequate performance is the childs' general failure to be strategic. The CBM work with children who have impulsive and academically based problems suggest that they also have problems in producing strategic plans

(Meichenbaum, 1979).

Brown and Barclay (1976) employed a stop check and study routine to facilitate generalization in educably mentally retarded children on memory recall, an ability that generalized to subsequent recall of prose passages. Burgio et al., (1980) did self instructional training with highly distractable retarded children in order to focus their attention and to cope with two tasks, math and printing. The results suggested that the training package produced direct and generalized changes in self instructional behavior. In addition, a decrease in off task behavior occured during math, printing and also during a phonics program.

Cognitive behavioral interventions have been influenced by the notion that thoughts or cognitions are subject to the same laws of learning as overt behaviors (Ulman, 1970). Banduras' theory of self-efficacy furthered the effect of cognitive processes on behavior (Bandura, 1977). Other influences come from researchers who have used cognitive treatment strategies that involve self-instructional training, reinforcement contingencies and modelling (Kendall & Finch, 1978, Lloyd, 1980, Meichenbaum & Goodman, 1971). The initial work in CBM with children focused on problems of self-control, impulsivity, hyperactivity and aggression, however, more recent efforts have been directed to academic relevant tasks.

There are a variety of techniques associated with cognitive self-control which include anxiety management training (Suinn & Richardson, 1971), emotional response routine (Chapman & Layden, 1971), idealized self-image (Susskind, 1970) and problem solving training (Camp et al, 1977). However, one of the most relevant techniques with respect to educational practice is CBM (self-instructional) training. It is appealing because it allows the student to be an active participant in the learning process and frees the teacher from constant supervision.

Meichenbaum and Goodman (1971) report that CBM training involves teaching the child specific verbalizations that follow a step by step sequence. These verbalizations are related to the specific problem of the child (spelling) and are modelled by the therapist and rehearsed by the child. The modelling and rehearsal sessions follow a defined sequence:

1. The experimenter or therapist does a task while talking outloud to himself and the subject or child observes (Cognitive Model)
2. The subject performs the task instructing himself or herself outloud with assistance from the experimenter (overt, external guidance)
3. The subject performs the task outloud by himself without assistance (overt, self guidance)
4. The subject performs the task while directing himself in a whisper (overt-faded self guidance)

5. The subject performs the task using covert (silent) verbalizations (covert self instruction)

The verbalizations modeled by the therapist and rehearsed by the child are generally of four types:

1. Problem definition ("What is it that I should do in this situation")
2. Focusing of attention ("I have to concentrate and do what I am suppose to do")
3. Coping statements ("Even if I make a mistake, I can continue more slowly")
4. Self reinforcement ("Great! I did it. That was Good")

The self evaluation provides a personal control over their behavior and outcome.

The self-instructional training makes it possible for students to consciously think about the task they are doing and guide themselves in an appropriate manner. The subjects' internal dialogue is used as a tool for facilitating such things as reading comprehension, problem solving and self control. "Self - instructional training may help the subject know exactly where to use what he has. He may have some mediational skills but yet not think to apply them in appropriate situations" (Meichenbaum & Asarnow, 1979, pg. 19). The overt verbalizations which are faded into covert verbalizations help organize material, aid short term storage, maintain task relevant behaviors and provide ways for coping with failure and reinforcing success (Meichenbaum & Asarnow, 1979).

Very young children and those with learning handicaps often approach complex problems in a disorganized fashion and solve them with great effort, if at all (McKinney & Haskins,1980). Researchers who have taught children strategies for processing information on memory tasks (Butterfield et al., 1973) and on problem solving tasks (McKinney,1972) show that even retarded children have the skills for efficient performance but often do not apply these skills without suitable instruction.

The self - talk component of CBM induces the child to the self as the cause and the proceedures evoke the perception of "I am doing this". The meaning of 'I' includes not only (I versus not I) but the volition (I choose), the predictability (I know why) and the mutability (I can change it). Thus, increased self-perception of'I can'not not only increases self-esteem but has motivational properties as well and can result in sustained goal oriented performance (Henker,1980). Cognitive training interventions have a considerable intuitive appeal, as they purport to bring about changes with the child that will enable him or her to deal effectively with a variety of problems (Keogh & Glover,1980).

O'Leary (1980) discusses a number of important factors that should be evaluated before initiating an instructional design:

1. Children must understand that a problem exists. They must have a reason for learning.

2. Developing better thinking behaviors in involves both the child and external (teacher) participation.
3. The target behavior or goal must be in the childs' repertoire.
4. Task difficulty must be assessed.
5. The childs' cognitive skill level must be ascertained as well as language maturity.
6. Failures must be minimized by carefully structuring tasks and training.

J. Application of CBM to Academic Tasks

Some educators have questioned the practicality of the CBM approach. They criticize the assumption that it takes too much time, it is impossible to implement individualized programs and that some of the procedures like self-verbalization will interfere with the learning of a particular skill.

Firstly, CBM is a specialized program and it does require some special skills to be comfortable and effective in its' use. Not every facilitator or client is suited for this type of approach. However, if the facilitator has the knowledge, skills, training and experience with the analytical and therapeutic features of the CBM approach and the client is suited for the program (ie. inefficient problem solving strategies) it would seem to be appropriate.

The initial stages of the program takes time to arrange. The teacher has to model the program then allow a sufficient amount of time for the student to practice the procedures before evaluating its' results. However, because the program is primarily designed for independent study the time spent in setting up the program may eventually consume less time then traditional program strategies that require the teacher to constantly monitor the childs' program and progress. CBM can be used for any number of students eventhough the strategies are individually designed it is possible to meet the needs of more then one child with relatively little effort in modification. Research has shown that in the initial stages CBM proceedures may effect the amount of learning because the individual is primarily occupied with procedure rather than in absorbing subject knowledge. However, once the procedures have been learned significant improvements have been reported (Meichenbaum and Goodman, 1971).

Although it is a relatively new approach to treating children with learning disabilities and its' generalized effects are questionable, some successes have been reported. Bornstein and Quevillon (1976), investigated the effects of a self-instructional package on three over active pre-school boys using a multiple baseline design across subjects. On task behaviors increased dramatically concomitant with the introduction of the self-instructional package and treatment gains were maintained 22.5 weeks after baseline was initiated.

Most cognitive training programs have involved children who are described as impulsive, hyperactive, aggressive, or generally, behavior problems. Some research that involves selfinstructional training with impulsive children includes Kendall and Finch (1978) who assigned 20 emotionally disturbed children to either a cognitive behavioral treatment group or an attention control group. After six treatment sessions of selfinstructional training the treatment group was rated by teachers as significantly less impulsive on the Impulsive Classroom Behavior Scale. Robertson and Keeley,(1974), claim to have reduced impusivity and improved WRAT spelling and reading with some children by using a treatment program that incorporated cognitive modelling, self-instructional training and reinforcement proceedures on the Matching Familiar Figures Test (MFFT).

The effectiveness of cognitive training in facilitating self-control and cognitive performance in aggressive boys has been investigated by Camp et al., (1977). Twenty-three agressive second grade boys were randomly assigned to either a cognitive training group or an untreated control group. The treatment group received daily half-hour training sessions for six weeks. The training exercises were taken from Camps' self-instructional "Think Aloud" program which emphasizes the modelling of cognitive strategies and the development of covert self-instruction. At the end of training, the treated group improved significantly more than controls on the Whechsler Intelligence Scale for Children-Revised (WISC-R), Mazes test, MFFT reaction time and an impusivity score derived from the MFFT. The treated children were also rated as improved by their teachers on significantly more pro social behaviors compared with controls.

Douglas,(1976), compared the behavior and test performance of hyperactive boys exposed to their cognitive training program with a control group of untrained hyperactive boys. After a three month training period, the treated children performed significantly better then the controls on the MFFT stories completion (a measure of frustration coping) and listening comprehension.

Lovitt and Curtiss, (1968), assessed the effect of having children verbalize an arithmetic problem before writing the answer and indicated that verbalization enhanced the childrens' performance. Grim and Bijou (1978), combined self verbalization with a strategy of breaking down a math problem with handicapped young children. They showed significant improvement performance when verbalization was added to the intervention. Smith and Lovitt (1976) indicated that a teacher who is verbalizing when she is doing a mathematical problem enhanced the learning process.

Kosiewicz (1979) using a single subject design, assessed an upper elementary students' writing accuracy in terms of letter formation across various treatment conditions. "Under self-instruction the student was required to verbally guide himself through the copying of each word by naming the word, each syllable in it and each letter in each syllable before copying it. Under the self-correction condition the student was required to circle errors on his previous days work before completing his assignment for the day. The two conditions were combined in some phases and when they were, copying accuracy was at its' highest. A fairly clean test of the selfinstructional proceedure produced dramatic increases over baseline performance (Lloyd,1980,pg. 57).

K. Strategy Useage with the Learning Disabled

Some researchers have suggested that performance deficiencies of some learning disabled children may be accounted for by their failure to employ efficient task strategies (Torgesson,1979). Hall,(1978), suggests that learning disabled children can perform as well as normally achieving children if taught to use appropriate recall,retrieval, or rehearsal strategies in solving problems. Havertape and Kass (1978) recorded the verbalized self-directions of learning disabled and normally achieving students as they were attempting to solve problems. These researchers concluded that in many cases, learning disabled students had fewer attack strategies to apply to problem solutions. The most striking result was that 40% of the learning disabled groups' responses consisted of random or impulsive answers without any relationship to problem requirements. Torgessen (1977) suggests that many learning disabled students do not perform as-well in school because they fail to adapt to tasks through efficient and organized strategies. Tarver et al., (1977) believe that learning disabled students are slow to develop in their use of efficient encoding strategies such as labelling and verbal rehearsal. Hallahan and Reeve (1980) suggest that the most parisomonious explanation for the learning disabled childs' tendency to have problems in attending relavent cues is his/her inability to bring to the task a specific learning strategy.

L. Research Methods

Assessing knowledge and cognitive processes has many problems. One problem is the accessability of cognitive processes for introspective analysis and another is the completeness or accuracy of verbal reports (Cavanaugh & Perlmuter,1982). These problems to date are very difficult or impossible to solve. As far as verbal reports are concerned, some researchers suggest that the focus should be in improving the verbal reports in order to make them more complete rather then solutions towards unequivable accuracy. Ericsson and Simon (1980) suggest:

7. Making the inquiry as soon as possible after the event
8. Minimizing the amount of probing
9. Examining the internal consistency of the reports
10. Avoiding 'why' questions, asking instead only for simple

descriptions

Another problem is the individuals' verbal ability which must be ascertained before attempting to use a design that requires verbal probing. Another equaly serious problem is the general lack of reliability measures because by and large, unique interviews, materials or tasks are used in separate experiments (Cavanaugh & Perlmuter,1982). Research in CBM has difficulty with generalization (Guralnick,1976),experimental control (Ledwidge,1978) and lacks replication (Robin,Armel & O'Leary,1975).

Problems inherent with verbal interviews is whether the questions actually assess what the researchers want to know and is the subject interpreting the question properly. Are the reports true reflections of what the subjects are doing or are they rationalizations or hypotheses (Cavanaugh & Perlmuter,1982). Another method has been to ask subjects to verbalize all thoughts that come to them while performing the task,however, a serious problem with this is that this 'think aloud' method may interfere with carrying out the task. Although probing while performing the task confounds this problem, Meichenbaums' solution is to use several types of verbal protocols which allows the researcher to uncover similar response patterns across methods. Another technique is peer tutoring where children who are taught a memory strategy teach it to another group of children. One advantage to this technique is that the measure of knowledge is implicit in the tutoring which eliminates probing.

However, there is no guarantee that children express all they know about the strategy. Another technique that is common is reaction time assessments. In these experiments, short response latencies indicate certainty and are interpreted as indicative of confidence in ones' answer (either that the response is correct or that one does not know) while long latencies indicate uncertainty and extended memory search. However, a major problem is not knowing what aspect of knowledge is involved (Cavanaugh & Perlmuter, 1982).

The preceding section reviewed some methods that have been used to assess cognitive processes. CBM research relies heavily on the subjects' information regarding strategy use Therefore, research on cognitive processes often contain verbal data that many people regard as unacceptable, jeopardizing the experiments' internal and external validity. The most common feature among the whole range of techniques used to obtain verbal data is when the subject responds orally to an instruction or probe (Ericson, 1980). Nisbett (1977) suggests that there may be no direct introspective access to higher order cognitive processes, instead, we have access to cognitive content. He suggests further that people may have little ability to report accurately about their cognitive processes. Nevertheless, Ericsson (1980) concedes that verbal reports which are elicited with care and are interpreted with full understanding of the circumstances under which they were obtained are a valuable and thoroughly reliable source of information about cognitive processes.

There is no one technique that is predominantly better than another and all of them are subject to criticism. To date, the best method is a mutiassessment approach that provides converging measures on the variables of interest (see Figure 3, Appendix B).

M. Generalizability,Transfer and Maintenance

Educators hope that by using CBM procedures with academic performance will increase maintenance of gains and transfer effects to areas of performance not directly trained. However,because of the low statistical power, few numbers of replications and infrequent follow ups makes maintenance and transfer effects difficult to assess (Lloyd,1980). The problem of generalization has been a major concern for the entire field of behavior therapy. Generalizations from CBM interventions has been very limited, however, that does not mean that cognitive procedures are inappropriate or unimportant. Many children have benefited from self-instructional programs. For example Robin et al., (1975) successfully taught kindergarteners identified as having handwriting problems to use self-instructions to improve their printing. However, the effects did not generalize to letters that had not been used. Nevertheless, some research points to the potential of CBM compared to other methods of control. In reviewing the research literature relative to the educational impact of medication, behavior modification and cognitive training, Keogh and Barkett (1979) concluded that all three interventions were selectively effective, but that the cognitive training appeared to offer the greatest possibility of transfer or generalization (Keogh & Glover, 1980).

III. Statement of the Problem

Spelling is very often viewed as a functional problem that promotes lack of confidence and lower perception of ability within the spelling disabled child. The literature review has presented many reasons for poor performance in spelling, however, along with these weaknesses it is also assumed from the research on learning disabled students that many children with spelling difficulties do not have efficient spelling strategies and/or organized plans that can assist them in their study and production of spelling.

The problem underlying this research project is related to current assessment/ remediation practices. Presently, children with learning problems are usually identified by their poor performance on academic tasks without examining the students knowledge of operations that may allow for efficient performance to occur. The delineation of how children derive solutions to problems on academic tasks involves the examination of processes. Therefore, this research design considered childrens' knowledge of strategies to use in spelling versus regulation of these strategies to be important for assessment/ remediation. This focus was inspired by the belief that ability deficits alone cannot account for the total variance underlying the performance difficulties of children with learning problems.

A. Research Design

This study involves a single subject qualitative analysis of spelling ability and strategies. The purpose of the study was to do an in depth assessment of strengths and weaknesses with students who have difficulty with spelling and explore the strategies they use for studying spelling words. The study also provided an individualized remediation program after assessment was concluded.

The questions to be explored in this investigation relate to the strategy awareness of the students and the relative effectiveness of a cognitive behavior modification (self-instructional) direct and traditional methods on learning familiar words.

Specifically, in a comparison across three subjects, do the students have spelling strategies and are they efficiently or inefficiently used? Secondly, can students be taught a strategy that is controlled by them which will lead to acquisition and maintenance of misspelled familiar words? Thirdly, will a difference be found in spelling achievement on a follow up spelling test that will be administered following the instructional program? Fourthly, will there be a qualitative differences between a self-instructional direct and traditional method of teaching spelling?

IV. Methods

Participants

The three male students involved in this study were aged 10 years, 8 months; 11 years, 2 months and 11 years, 6 months. They were all experiencing difficulty in spelling that was not due to a physical impairment, hearing deficit visual problem or emotional problem. The three students were refered to the study by both parents and teachers because all the students were behind grade expectation in spelling ability and displayed a delay in spelling achievement. All of the students had been classified as learning disabled by their respective schools.

Procedure

There were three students and two teachers involved in this exploratory study. Prior to the study both teachers were trained on the use of the test instruments and methods to use for exploring spelling strategies, along with being provided information about the remediation strategies to be used with each student. The study was conducted during the summer and lasted for 4 weeks (July 11 to August 5). The students were required to attend their sessions for five days a week and for two hours a day. On the first day of the program the children and their parents met with everyone involved in the project and were explained the aims of the study. Following this introductory meeting each student was randomly assigned an instructor who was with the child for the entire program. Two of the students (Subject 1 & 3) attended morning sessions and the other student attended an afternoon session. From July 11 until July 20 each student had their spelling ability assessed which included strengths, weaknesses, strategies and perception of ability. Each student was administered the same assessment tests by their individual instructor which are described in the 'Test Instruments' section. Following the assessment individualized remediation was provided and then each student was reassessed. During the pre-treatment assessment sessions the instructors continually probed their students with questions aimed at gaining further information concerning their strategy knowledge and useage (see Appendix A). Each instructor was provided assistance with respect to example questions to be intermitantly used for obtaining more qualitative information regarding the students' spelling metaknowledge. Since the major thrust of this study was to explore the strategies used by these students when studying spelling words many of the sessions were video-taped in order to aid in the analysis. After the assessment was completed each instructor was assigned with a particular teaching method to employ with their students. The cognitive modification (self-instructional) approach was assigned to the teacher who had previously used this method in a pilot study that was conducted prior to this exploratory program. The 'Traditional' and 'Direct' teaching approaches were assigned to the other instructor for her students. The operational definitions of each approach are described in the following section and then more thoroughly examined in context of each students' program evaluation and remediation.

Remediation

As was explained earlier each student was assigned an individual instructor and assigned a particular method of instruction. Each student was given a spelling test from the word recognition assessment (see Test Instruments) in order to obtain a common baseline of misspelled familiar words. Thirty-six familiar words that were misspelled by all three subjects were chosen for instructional remediation. Beginning July 28 until and including August 4 each student was given 6 words a day to study. On August 5, the last day of the study all students were given post tests and then dismissed. After completion of the program all of the parents were informed of the studys' findings as they related to their child. The results of the assessment ,description of the individualized teaching methods ,effects of the various approaches, student evaluations and the answers to the research questions are provided in the Results section.

A. Instructional Approaches

Traditional Approach

For the purposes of this study the instructor utilized an adaptation of the traditional (group) approach which primarily involved the use of workbook exercises from a provincially approved spelling program to remediate one of the youngsters' spelling aquisition. The words chosen for remediation were grouped into six units that were considered to meet his assessed needs. These units provided practice with such things as phonics, grammar and writing. The instructor focused on his weak areas in spelling by employing his spelling strengths. Along with using the workbook exercises the instructor monitored his work each day; securing correct pronounciation of words and providing material for the student that ensured an outlet for reference (ex. dictionary, tape recording of spelling words). After each days' unit was completed the instructor tested the student on his spelling words and required misspelled words to be rewritten and further studied.

Classroom teachers very often assess their students' spelling proficiency then place them in spelling workbooks according to their corresponding ability level without consulting their students about the findings of the assessment. Knowledge about ones' performance has been shown to positively influence treatment effects (Kennedy & Miller, 1976). A passive learning style might be encouraged by excluding the learner when designing a remediation/instruction plan. In order to examine this hypothesis the instructor did not provide feedback to the student about his analyzed strengths and weaknesses and hence did not involve the student as an active participant in the remediation process. Rather then informing the student on the efficiency and/or inefficiency of his strategies and mutually incorporating the remediation approach, the instructor simply assigned exercises from the spelling workbook (Spelling in Language Arts'). The instructor made sure that the exercises related to the students' strengths and weaknesses, checked his work and provided intermitant assistance.

Direct Approach

The direct approach to teaching is very often identified as a behavioral approach based on Gagnes' (1970) taxonomy of skills and popularized by Englemans' (1976) remedial series. The procedure can be implemented for any student, however, the teacher must possess certain skills and knowledge. Program design and instruction are intricately detailed and based on such things as discrimination learning, reinforcement contingencies, shaping and fading. Students' skills must be assessed along with establishing and sequencing task analysis, goals and objectives.

For the purposes of this study, the instructor did not use or explicitly follow the process recommended in current publications (Engleman, 1977, Baine,1982) but was guided by some of the general priciples associated with direct instruction. The instructor carefully analyzed the students' spelling skills and constructed an individualized spelling program according to his needs. The instructor included the student as an active participant in the remediation process (unlike the traditional approach). The student was provided information concerning his assessed strengths and weaknesses and shown the reasons for his difficulty. The student was made aware of the efficiency and/or inefficiency of his spelling strategies and explained the objectives of the remediation program. The instructor co-ordinated some of his already used strategies in studying spelling words into a more efficient plan.

The instructor organized the students' remedial program into six units that corresponded with his major areas of difficulty and provided a study procedure that utilized the recommendations for effective teaching in the spelling research cited previously.

B. Self-Instruction :CBM Approach

The self-instructional program designated for remediation in this study was based on a cognitive behavior modification program originally developed by Meichenbaum of Waterloo University. It was originally designed to remediate behavioral difficulties by enhancing self-control,however,for the purposes of this study the basic design was incorporated into a self-instructional program to remediate spelling difficulty. Specifically, to provide a study strategy for spelling. By learning the following procedure the subject was expected to develop a means of self-instruction with respect to the studying of spelling words. The subject was required to verbalize the procedure overtly until mastery was evident then gradually fade to a covert verbalization. Initially, modelling was the principle means of instruction. Therefore, the CBM approach to studying spelling words is modeled for the students by the instructor. Along with modeling, overt and covert verbalizations the CBM approach emphasizes selfassessment, self-reward and selfevaluation as principle parts of the design.

Description of the CBM Procedure

1.

The student will look at the word, say it outloud, write it and then check the word. However, before performing this task the student will ask himself the question "What is my plan?",then answering "I am going to learn how to spell this word so when I want to write the word I will know how to spell it correctly so everybody will be able to recognize it." After correctly copying the word the student will reward himself/herself for successfully completing the first task; "Good, now I can concentrate on learning this word."This first step draws attention to the task and creates a mind set for further study.

2. The next step is for the subject to create a visual image in aiding recall of the correct spelling. The subject will imagine that he is writing the word on a large surface such as a chalkboard. The subject will close his eyes and pretend that he is writing the word while saying outloud each letter of the word. If he is unsure of the correct spelling he may look at the spelling of the word and then continue to practice until he/she is able to create an image of the word without looking at the spelling of the word. After successful completion of this procedure the subject will reward himself/herself. For example: "Now that I have written the word I am going to put it in my mind so that I can have some place to look for it when I need to to spell the word". This exercise forces the student to attend to the task of spelling the particular word of study and requires concentration for successful completion of the task. The student will conclude this step by rewarding himself/herself. For example: "Good, now I have put this word in my memory so that I have some place to look for it later."
3. Next, the student writes the word and says each letter of the word. He will do this twice to see that the word

has been written correctly each time. This step promotes organization of correct motor patterns and the subject begins to understand that each syllable can be represented by more then one unit. The student establishes a one to one relationship with spoken and written symbols as he writes and names each letter. The student is learning to label, discriminate recall and organize through a mutisensory approach and strengthens the visual image of the word he has created in step 2. This procedure caters to different combinations and difficulties of spelling performance. Auditory analysis is aided by overt verbalizations and visual analysis is aided by writing and seeing the word. Steps 1,2,and3 are consistant methods considered to be essential in spelling. Spelling (as was noted in the literature review) involves motor skills, automatic recall, discrimination, memory and integration and practice. The student acquires knowledge of spelling by working with the word in a structured way rather then by habit. This method takes away the immediate demand to spell words phonetically which creates a lot of errors. Students should begin to see the orthographic nature of words which good spellers seem to excell in.

4. At the beginning of the study session each student will be shown the words he/she will be responsible to study. Each student will be required to construct word cards. Each word card will have one of the words he has to

learn to spell with two letters missing. Each subject will make his/her own cards and place the blank spaces in various positions for the different words. When the student is at step 4 of the program he/she will get the card for the particular word he is studying (which until now has been filed in a separate place) and then by starting at the beginning of the word will verbalize outloud each letter and also fill in the blanks with the missing letters. This procedure is related to the clozure technique used in reading comprehension strategies. The aim is to develop patterning and sequencing which are essential components in spelling. Spelling depends on storage of letter identity and sequence. This method avoids direct emphasis on letter sound relationships which due to the inconsistant orthographic structure of the English language causes many problems in spelling. After completing the word card the student will check his/her work with the correct spelling of the word and then reward himself/herself for his/her accomplishment.

5. After completing step 4 with the first word the student returns to step 1 with the next word and then continues the program until all the assigned words have been completed.
6. When the student has finished all the words he/she will be required to make a sentence or sentences that contain the spelling words that relate to separate ideas or are

interrelated to express one idea or story. The format choice is determined by the student and she/he will be expected to write and verbalize the sentences. The aim of this exercise is to make the task of spelling study meaningful. The emphasis on this task is on the correct spelling of the studied words and not the correctness of the other words used in constructing the isolated sentences or story.

7. The final exercise requires the student to write all the study words from memory and then indicate the words he knows for sure that he has spelled correctly. After completing this task he/she will check his/her work and reward himself/herself verbally. If the subject misspells a word or is not sure of the correct spelling of a word he/she will be required to repeat steps 1 to 4 with those words he/she misspelled or was unsure about.

All these steps contain essential strategies that are considered by many researchers to be important elements of a successful spelling program (see Literature Review on Spelling). The approach used for efficient acquisition and use of these strategies is based on Meichenbaums' cognitive behavior modification model which stresses overt verbalization of efficient problem solving strategies that are later converted to covert verbalizations, selfinstructional proceedures, self assessment, self-evaluation and self-reward.

For the purposes of this study and because of the inherent quality of the CBM design the student who used this technique was an active participant in the remediation process. The student was informed of his analyzed strengths and weaknesses and explained the purpose of the remediation. Due to his particular needs certain alterations to the preceeding general design were instituted which will be explained within the 'Results' section.

Test Instruments and Rational

The students in this study were administered 18 analytic tests. The principle aim was to examine the major factors including strategies that could influence spelling performance . The assessment was conducted during the first eight days of the study (2 hours a day) and was followed by remediation and post testing. The testing instruments included recognized measures for assessing spelling ability with respect to age/grade level (Schonell,WRAT) and additional standardized measures (Woodcock, Slosson) to evaluate letter identification competency, sight word recognition ability and word attack skill. Additionally, subtests from the WISC-R and Detroit Test of Learning Aptitude (Digit span, Visual attention span) were given to assess short term memory capacity in relation to a normative group along with examining sequencing ability. Furthermore, these subtests were conducted to explore strategy employment with respect to recall in relation to a string of unrelated digits and letters.

The assessment battery also included unstandardized instruments (Diagnostic Spelling Test, Pairs Test of Decoding) which were used to further evaluate the students' spelling errors and discern their phonetic ability. For the purposes of this study these tests were considered more beneficial for obtaining qualitative information than other assessment devices (for example,Brigance). Hence, the format of these tests are presented in the appendix section of this thesis. Additionally, some of the instruments used in the assessment process (Guideline for Probes, Spelling of Word Parts, Consonant Blend and Digraph Assessment, Alphabet Writing Test, Informal Diagnostic Assessments,Parts 1,2 and 3) were created by the author in order to become more cognizant of the students' spelling skills and to detect the students' metaknowledge and strategy employment with respect to spelling and study methods. These devices can be found in Appendix A.

The Language Arts Word Recognition Test, Spelling Test and the Informal Diagnostic assessments (see Appendix) utilized the words contained within the Spelling in Language Arts series (Nelson,1976) in order to establish a common baseline of misspelled familiar words to be used in the remediation process. This publication was also considered to be an appropriate source of words that contained a variety of orthographic patterns. Along with the forementioned tests all of the students were required to complete an academic self-concept scale (SPAS) in order to acquire knowledge concerning their perception of ability in spelling.

Additionally, the instructors used observation rooms with one way mirrors and peer teaching to investigate spelling strategies. A description of the test instruments used in this study along with a rational follows.

C. Woodcock Reading Mastery Tests,Form A

The "Letter Identification Test" was given in order to establish the subjects' knowledge of the alphabet.In this test the subject is shown various letters of the alphabet and is asked to verbally give the letter names. The "Word Recognition Test" was given in order to obtain an estimate of the subjects' sight word recognition ability and approximate grade level of ability. The words are arranged from a grade one to grade twelve level of reading ability. The subject is shown the words and is asked to verbalize them. The "Word Attack" test was given in order to assess the subjects' ability in phonetic decoding. For example, the ability to recognize, segregate and pronounce word parts such as syllables,consonant blends, vowel digraphs and dipthongs. This test consists of nonsense words so the assessment of decoding skills and not word recognition can be obtained.

D. Pairs Test of Decoding Skills

(see Appendix A)

Subtest A -- Initial Consonants
Subtest B -- Final Consonants
Subtest C -- Middle Short Vowels
Subtest D -- Middle long Vowels and Vowel Digraphs
Subtest E -- Initial Consonant Blends
Subtest F -- Final Consonant Blends and Final Digraphs

This test was given in order to obtain a diagnostic assessment of the subjects' ability to pronounce and recognize initial and final consonants, middle and long short vowels, vowel digraphs, initial and final consonant blends and final digraphs. The student is shown pairs of similar looking words and is asked to pronounce the second word in the pair after the examiner has pronounced the first word of the pair.The examiner is assessing the correct pronounciation of the particular component of each subtest. The purpose is to isolate strengths and weaknesses in word decoding skills that may be responsible for spelling difficulty.

E. Spelling of Word Parts

(see Appendix A)

This test consisted of major word parts found in English orthography such as consonant blends, dipthongs and digraphs. The instructor pronounced these word parts to the student who was required to write down all the possible ways the sound could be represented by letters. This was done to discover the students' general ability to assimilate letter sound correspondences.

F. Consonant Blends and Digraphs Assessment

This test (see Appendix A) consisted of common consonant blends and digraphs found in English orthography. The students were shown these common word parts printed on flash cards and was asked to pronounce them without the aid of having them within the context of a word. This was done in order to gain a better appreciation of the subjects' ability to pronounce common word parts.

G. Informal Alphabet Writing Test

(see Appendix A)

This test required the students to write the letters of the alphabet from memory in order to qualitatively assess the students' ability to reproduce the letters necessary for the spelling production of words.

H. Digit Span Test, (WISC-R)

This test required the students to listen to a series of numbers that were orally presented to them by the examiner and then repeat the numbers back to the examiner both forwards and backwards. The purpose of this test was to assess the students' ability to retain a string of symbols. The students first need to mentally sequence numbers and then verbally reproduce them. Then they must rearrange the sequence /of numbers and then verbalize them backwards.Essentially, this test assesses the students' short term memory and ability to manipulate a series of numbers mentally. Another aim of this test was to determine the presence of memory strategies. The students were closely observed while performing this task in order to discover if they executed any strategies such as rehearsal or chunking to aid their recall. Furthermore, the students were asked if they did anything to help them recall the string of numbers.

I. Visual Attention Span for Letters

This test was given as an informal assessment of visual memory for letters. This test was different from the Digit Span Test in that the unrelated sequence of letters (absence of consonant blends,digraphs etc.) were presented to the students' visually on flash cards rather then orally presented. The purpose of the test was essentially the same as the Digit Span Test, however, the content was considered more meaningful with respect to the production of spelling words. Similar to the Digit Span test one of the aims of the assessment was to discover if there were any strategies used by the students such as letter rehearsal to aid in the recall of letters. The students were shown a series of letters on flash cards that varied in length from 2 to 7 letters and after a short delay were asked to recall the exact sequence of letters. Observations of their behavior (lip movement) was conducted in order to determine the presence of memory strategies. Subjects were also asked to verbalize any methods they used to aid their performance on this task as was done in the Digit Span Test.

J. Auditory Discrimination Test

This test (Wepman) was comprised of word pairs that were either similar or dissimilar in sound. During this test the student sits facing away from the examiner and is asked to report whether the words that are orally presented to him sound the same or sound differently. The purpose of this test is to assess whether the subject can differentiate between sounds and to predict through this screening device whether the spelling difficulty is due to a discrimination problem.

K. Slosson Oral Reading Test

This test was given to assess sight word recognition ability and approximate the grade level. The intention was to provide further support for the findings on the Woodcock

L. Wide Range Achievement Test,(WRAT)Spelling

This test was given to assess the students' written performance in spelling and to obtain an approximate grade placement.

M. Diagnostic Spelling Test

(see Appendix A)

This test was given for further assessment of the students' written performance in spelling with different orthographic patterns.

N. Schonell Graded Word Spelling Test

This test was given in order to obtain a spelling age for the student. It was also used to ascertain spelling delay by comparing the students' spelling age with his chronological age.

O. Language Arts, Word Recognition Assessment

(see Appendix A)

In this test each student was shown words printed on flash cards from levels 3,4 and 5 of the provincially sanctioned 'Spelling in Language Arts' series. This series uses words comprised from the Dolch list of most common words used in the English language. The words recognized by the student during this assessment were used for the 'Language Arts Spelling Test' from which misspelled words were ascertained for the purpose of remediation. The recognition test was given in order to eliminate the possibility of word unfamiliarity as being a cause of spelling difficulty.

P. Language Arts Spelling Test

(see Appendix A) This test was comprised of words that were familiar to students on the 'Language Arts' Word Recognition Test.The purpose of this test was to obtain a list of words that all subject could recognize but were unable to spell. During this test the students were also asked to draw happy faces and sad faces next to the words they spelled to indicate which words they were sure they spelled correctly and which words they were sure they spelled incorrectly. The purpose of this exercise was to assess the students' ability to predict their spelling performance. This ability was to be assessed later on the post test by using the same method after remediation.

Q. Informal Diagnostic Assessment,Part 1

The list of words (see Appendix A) in this assessment represented general orthographic patterns and non letter sound correspondences. Each subject was shown these mixture of words and asked to verbalize the way he would use to study them. The purpose of this assessment was to discover whether the student had a particular strategy for studying spelling words , assess the efficiency or inefficiency of his strategy and to discover if the strategy employment was consistent with words that had a variety of patterns.

R. Informal Diagnostic Assessment,Part 2

This assessment (see Appendix A) was designed to provide consistant evidence for the spelling strategies used in Part 1. Each student was shown the same words shown in Part 1 and was asked to spell each word after a short exposure to the word by using small file cards. There were two sets of file cards. One set comprised of the individual letters of the alphabet printed separately on each file card. The other set had common letter combinations printed on the individual file cards such as consonant blends, digraphs and dipthongs that could be used to spell the visually presented words. The major question to be answered was would the student primarily use a grouping technique or a letter by letter technique.

S. Informal Diagnostic Assessment,Part 3

This test (see Appendix A) was designed to provide consistant evidence for the employment of spelling strategies used in Part 1 and 2. The students were provided the same words used in part 1 and 2 typed on sheets of paper . For each of the words the subject was asked to choose among a number of provided alternatives the method he would use to study and remember the spelling words or provide a method that he would use that was not provided. The aim was to discover whether his choice of strategy was consistant with the verbalized method in Part 1 and the visual motor method in Part 2.

T. Student Perception of Ability Test (SPAS)

This test which was designed by Boersma and Chapman (1979) was given in order to obtain an evaluation of the students' perception of ability in spelling.

U. General Aims of Tests

1. To obtain a measure of spelling ability
2. To obtain a measure of word recognition ability
3. To obtain a measure of phonic decoding ability
4. To obtain a measure of auditory discrimination of sounds
5. To assess attention span
6. To obtain a measure of letter recognition
7. To discover if subjects have spelling strategies and employ these strategies in a spelling situation
8. To obtain a measure of academic self concept with particular reference to perception of ability in spelling

V. Results and Discussion

This chapter contains three major areas of focus. The first area deals with each subjects' assessment/remediation. In this section a brief description of each subject is followed by the test results obtained during the pre-assessment period. Additionally, a delineation of the remediation strategy, a detailed account of the lesson plan and a summary of the program effectiveness is particularized. The reporting is done on an individualized basis in accordance with the following format:

1. Subject
2. Test Results
3. Remediation Strategy and Rational
4. Lesson Plan
5. Summary and Conclusion

The second focus pertains to the answers of the research questions outlined in a previous section entitled "Statement of the Problem". Generally, this section discloses information related to the spelling strategies used by the subjects and the effectiveness of the individual remediation approaches.

The third focus is allocated for a general discussion. This section represents the studys' findings in relation to metacognition, spelling research and cognitive processes. It concludes with recommendations for teachers and future investigations.

A. Subject 1

This student was aged 10 years and 8 months. He presented himself as a healthy, well-mannered ten year old boy with varied interests and an outgoing personality. He comes from a small family of three children with both parents working.His older brother often helps him with his school work and gives him encouragement. His father is also involved with his learning by stressing that he learn more and faster.

Test Results

Results from the standardized measures used in this study are presented in Figures 1 and 2 for all three subjects. The results from the nonstandardized measures and informal assessment proceedures are contained within the context of the subjects' report.

Figure 1

Pre-Remediation Assessment

Background Information	Sub. 1	Sub. 2	Sub.3
Age (Years;Months)	10.8	11.2	11.6
Grade	4	4	4
Intelligence (Thorndike,FS)	98	103	105
Tests	Sub.1	Sub. 2	Sub.3
Letter Identification(Gr.Score)	12.9	2.9	4.3
Word Identification(Gr.Score)	3.9	2.1	4.0
Word Attack(Gr.Score)	1.9	2.7	3.5
Slosson (Gr.Score)	4.6	3.6	5.9
Digit Span (Stanine)	5	11	12
Visual Att.Span (Mental Age)	10.0	10.0	10.0
WRAT (Gr.Score)	2.8	2.7	3.7
Schonell (Spelling Age)	8.9	7.0	8.2
SPAS (Raw Score)	38	26	47

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Figure 2

Post-Remediation Assessment

Tests	Sub.1	Sub.2	Sub.3
Letter Identification(Gr.Score)	12.9	3.0	4.3
Word Identification(Gr.Score)	3.7	2.6	3.7
Word Attack(Gr.Score)	1.9	3.8	4.2
Slosson(Gr.Score)	4.6	4.0	6.3
Digit Span (Stanine)	6	11	12
Visual Att.Span(Mental Age)	10.0	10.0	10.0
WRAT (Gr.Score)	4.1	2.9	3.7
Schonell (Spelling Age)	8.6	7.0	8.4
SPAS (Raw Score)	39	30	45
Remediation Spelling Test	27/36	14/36	35/36

Woodcock Reading Mastery Tests Form A

This student worked quickly on all three subtests. The Letter Identification Test was entirely correct,with four letters being self corrected after an incorrect first response. His Reading Grade score was below his grade placement being 3.9 instead of 5.0. His Reading Grade score for the Word Attack was far below his grade placement, being 1.9. His inability to decode and correctly pronounce nonsense words suggests inefficient phonetic strategies with respect to spelling.

Pairs Test of Decoding Skills

On all subtests, this student made many errors but self-corrected quickly. He seemed to work quickly on all sub-tests and displayed reversal tendencies (for example;correct word was 'bead' and he would say 'dead'). He appeared to encounter the most difficulty with words such as pant, dusk, fist, and ramp. He sometimes substituted words of a more common nature which may have been more similar to him, for example, 'first' for 'fist' and 'rap' for 'ramp'.

Consonant Blends and Digraphs Assessment

In some instances this student needed to produce a word that had the blend or digraph contained within it before he could match a sound to it. When asked to provide a word for each sound, he had no problems and spontaneously gave more than one example. Most prompting was done for letter combinations that had the letter 'o' included. In the majority of the cases, he used words which contained the blend or digraph at the beginning of the word, with the exception of the 'ow' sound in 'yellow' and the 'ph' sound in 'paragraph'.

Informal Alphabet Writing Test

He made two consistent errors in this test. First, he omitted the letters 'k' and 'l' in both upper and lower case, secondly, he reversed the letters 'u' and 'v' within the alphabetical sequence of letters. This difficulty may be affecting his spelling ability.

Digit Span Test

His score on this test was 4 for forwards and 3 for backwards, both being below standardized norms for his age group. In three of the four sequences of numbers he had the correct digits in the initial and final positions with the middle digits correct but in the wrong order. His inability to properly sequence these numbers may indicate sequencing difficulty in spelling as was suggested during the informal alphabet writing test.

Visual Attention Span for Letters

He demonstrated a little better ability in repeating a series of unrelated letters than he did for repeating an unrelated series of numbers (5 letters forward) however, he still displayed sequencing difficulty. Through questioning he revealed his strategy for recall indicating that he looked at each set of letters one letter at a time and counted the number of letters in each set to be sure that he said enough letters when repeating them. His failure in this task reflected his inability to recall the letters in the correct order rather then being unable to recall all of the letters,for example, recalling ;fplscn' instead of 'fpclsn'.

Auditory Discrimination Test

This sreening test did not reveal any significant difficulty with respect to differentiating sounds of words.

Slosson Oral Reading Test

The results of this test were consistent with the results from the Woodcock which indicated below grade placement ability in sight word recognition.

Spelling of Word Parts

After listening to a word part the student was required to write down as many ways to spell the sound as he could. Although some of the vowel combinations were correct, the majority of errors were with vowel combinations involving an 'o'. Another weak area involved the r-controlled vowels of ar,er,ir,or,and ur. With many of the word parts he used a combination of upper and lower case letters. Many of the initial consonant blend spellings included inappropriate letter-sound correspondences, for example, 'bl' spelling also included 'bu' as an alternate spelling. It appeared as though he was picking up on the vowel sound after the blend rather than the blend sounds alone. This type of confusion could affect his spelling.

Wide Range Achievement Test,Spelling

During the test the student worked very quickly without checking the word after writing it. He often asked for the next word before the examiner had completed the example sentence containing the spelling word. However he usually whispered the words to himself while he was writing the word. His raw score placed him at a grade equivalent score of 2.8. The day following the test he was asked if he could read the words he spelled. Eventhough many of his spelling words were incorrect he was able to recite the words originally given on the test. For example, he said "nature" for "nurture" and "edge" for "eghe". When questioned he said that he knew the words because he could remember them from the previous day. He said, "the first letter helps me say the rest of the word". Many of his misspellings were graphically similar to the correct spellings , however, he seemed to confuse the position of the sounds. For example, "imanger" for "imaginary". This indicated that he had better ability to recall the beginning and ending sounds of words than the medial sounds.

Diagnostic Spelling Test

This test revealed errors associated with letter substitutions and letter omissions along with difficulty with vowel combinations and vowel-r combinations such as ar,ir,er,and ur.

Schonell Graded Word Spelling Test

This test suggested that his spelling age was 9. During this test some probing was done to obtain some information regarding his spelling strategies. When asked if he saw the words he was spelling in his mind he replied that he saw pictures of the words rather then the letters of the word. For example, he saw a picture of a can for the spelling word 'can' and he saw a picture of a net for the spelling word 'net'. He stated that while spelling he usually related objects to the words he heard. Additionally, he reported that he would "sound out words in order to spell them" but only words he could pronounce or that he used everyday or "wrote down often like the days of the week". Furthermore, he stated that tracing the word helps him in spelling. He mentioned that his resource room teacher asked him to use his finger to spell words in order "to train his hand to spell the words". While administering the Schonell it was observed that he would trace words on his lap or beside himself on the couch before writing his response. The instructor learned while probing that he primarily used two strategies to aid his spelling. He stated that "writing down the word helps or trying to remember how the word is spelled by closing my eyes and blocking everything else out".

Language Arts,Word Recognition Assessment

This student made few errors on this sight word recognition assessment. The last consonants of the words were the most difficult for him to pronounce, however, he did not have to rely on phonetic analysis for the majority of the words.

Language Arts Spelling Test

All the words from the Language Arts Word Recognition Assessment were given in the form of a spelling test. Although he was able to recognize and read all of the words he was not able to spell them all correctly.

Informal Diagnostic Assessment,Part 1

This informal assessment involved the use of questions geared towards the discovering of what strategies the student uses in spelling and if the process he explains is actually used in the study of spelling words. In order to ascertain this information a number of probes (see Appendix A) were used. In order to obtain more reliable information these responses were compared to the ones obtained during the formal assessments as well as the ones obtained from Part 2 and Part 3 of the Spelling Cognition Assessments.

This informal assessment indicated that the student uses a variety of methods to learn or study spelling methods with particular emphasis on the need to write the words several times in order to remember it. He mentioned that the middle parts of words were the most difficult to remember,especially vowels and vowel combinations. He seemed to have some notion of syllables and word parts but used this knowledge inconsistantly. His definition for spelling was "putting letters together so that they mean something",and he indicated that the most difficult part of spelling was putting the letters in the correct order. He reported that his primary method for studying spelling words involved only studying the words he didn't know or could not pronounce. Another method he used for studying spelling which was both reported and observed involved "going over every word",by saying each letter outloud, saying the letters in order and trying to remember word parts. It was generally observed that he just casually glances over words he knows but tries to "sound out" the more difficult words. He reported that he looks for word meaning in a dictionary and only writes down words that he thinks are especially difficult. He reported that he knows when he has spelled a word incorrectly and is discouraged when he doesn't know how to spell a word.

Informal Diagnostic Assessment,Part 2

For this part of the assessment, cards having single letters or letter combinations on them were presented to the student in order for him to use them in constructing words shown to him on another card. His method of spelling the words by using the small file cards was not consistant and seemed to depend on which letter or letter combination he saw first, rather than having a regular strategy or method. For example, he used some combinations appropriately such as sl ee p for sleep while breaking up other words unconventionally such as
sp e a k for speak.

Informal Diagnostic Assessment,Part 3

On this part of the assessment, he was asked to choose the best method of studying spelling words from a list of alternatives or he could supply another method if it wasn't represented. For example , he would be asked if it would be better to study the word "groan" letter by letter or by breaking the word into parts

1. g r o a n
2. gr oa n
3. gro an
4. groa n
5. -------- (see Appendix A)

There was little consistancy with respect to the way he indicated that he would study. His strategies for studying

spelling words seem to be varied and often inappropriate. For example, he reported that he tries to "study and remember word parts" however, on this assessment he chose studying words letter by letter as a predominant method. Furthermore, when he broke words into parts it was usually done unconventionally such as sp la sh
for splash and fas test
for fastest

Other Assessment Techniques

Other methods of studying this students' spelling strategies included the use of peer-teaching and video-taping a self-study session. The self-study session involved presenting him with 15 words to study by himself for a period of twenty minutes. It was observed that he first read all of the words on the list outloud then wrote each one of them on the blackboard 5 times. He repeated the words outloud as he wrote them, sometimes saying the whole word but more often just saying the word parts or letter sounds. When the instructor returned he mentioned that the words were easy to spell because he knew them. When asked what he would do with a word that was more difficult he reported that he would write the word more times ,"like 10 times".

The peer- teaching involved the student taking turns being the teacher and the learner. When he was being taught , the method used by his peer differed so greatly that he appeared to be ill at ease. His method emphasized writing the spelling words down, however, the method taught to him by his peer involved sounding the word, saying what it meant and then memorizing it by looking at it for just a few seconds. He was able to cope with the frustration because he knew the words being taught. When asked to pronounce the words outloud they were often incorrect. For example: "usual" for "unusual",for"scene" he said "since" and for "chose" he said "choose". Furthermore, these errors were not corrected by his peer teacher or himself.

When he taught his peer, he used the primary method that he verbalized and displayed earlier which was writing the words down many times. He became very frustrated with his peer because of his peers' slow manner and constant mistakes. He expected certain standards to be met,such as, not writing too large or too small,writing neatly and quickly. He would sometimes offer a form of encouragement for his peer to work more quickly by coaxing him along and suggesting a race. Generally, however, he appeared impatient with his peers' performance throughout the video-session as indicated by requesting quicker performance from his peer and by ignoring some of his peers' suggestions for spelling.

Student Perception of Ability Scale

Generally, this student showed a more positive then negative self concept except in the area of spelling. All responses to questions with respect to perception of ability in spelling were negative.

Item No.	Question	Response
3	All new words are easy to spell	No
13	I am good at spelling	No
15	I have problems with spelling	Yes
17	I am happy with the way I spell	No
36	I like spelling	No
49	My spelling is always right	No
54	I find spelling hard	Yes
59	I am slow at spelling	Yes
62	I usually spell words right	No

The information gathered from all the assessments were used for the remediation that was based on a 'traditional' approach to instruction. His strengths were used to remediate his weaknesses through structured lessons that were derived from the "Spelling in Language Arts" series. The reasons for implementing the study exercises were not divulged,hence,he could not be considered to be an active participant with respect to the remediation design.The words spelled incorrectly on the "Language Arts Spelling Test" by all of the students involved in the project were used in the remediation process (see Appendix A)

Remediation Strategy and Rational

This students' remediation was based on the "Spelling in Language Arts" series which is provincially approved and commonly used within the Edmonton school system. The original words used for the word recognition assessments were drawn from the grade 3,4,and 5 student books of this series. The words correctly identified but spelled incorrectly,as stated earlier, were grouped into lists of six words each. The word lists were incorporated into "units" within the series and provided the basis for remediation which lasted for six days.

Although each lesson was built around specific units, each unit met the students' needs by concentrating on his weaknesses by working through his strengths. One of his weaknesses was working too quickly. The units used for remediation required concentration and were corrected at the end of each lesson. In this manner, he was held somewhat responsible for the completion of his work.

Another one of his weaknesses appeared to be related to his mispronounciation of words and word parts. The exercises included in each unit was focused on how the words sound as well as including exercises on word parts. One component was added to the use of the workbook exercises. Each units' word list was pronounced by the instructor,repeated by the student and recorded on a cassette for the students' reference during each lesson. A dictionary was also provided for the students' use and a mid-session check by the instructor was instituted to confirm the correct pronounciation of the list words. Much of each lesson plan was based on his assessed strengths. He had shown on numerous occasions his desire to write the spelling words as a study strategy. The units required a large amount of writing with much repetition which was suitable to his needs. Added to the exercises was the requirement of writing all the list words prior to the commencement of each lesson and following the pronounciation of the words. A tape recorder was used during this exercise so he could listen to the words as he wrote them in order to strengthen his phonetic analysis of words. The series also recommended a test-study-test approach which was instituted in the program.

The following units were used in conjunction with the familiar misspelled words used for remediation:

Day 1: Unit #7, Book 4 "Spelling in Language Arts" series

Words: aren't I've
knowing colour
ordered alarm

Worksheet: "Shrink and Match",pg. 106

Day 2: Unit #1, Book 4 "Spelling in Language Arts" series

Words: mammal coach
cattle perhaps
plain war

Worksheet: "R-controlled Vowels",pg.109

Day 3: Unit #8, Book 4 Spelling in Language Arts series

Words:
branch
helicopter
airport
knock
breaking
answer

Worksheet: Compound Scramble,pg. 107

Day 4: Unit #1, Book 5 Spelling in Language Arts series

Words:
freeze
holiday
lively
berry
between
rifle

Worksheet: Link-a-compound,pg. 114

Day #5 Unit #5, Book 5 Spelling in Language Arts series

Words:
correct
mistake
problem
dozen
perfect
term

Worksheet: Prefix Corral, pg. 102

Day #6 Unit #8, Book 6 Spelling in Language Arts series

Words:
explore
growth
return
following
shown
neat

Worksheet: Old-Man-Out, pg. 105

Lesson Plan

1. He listened to the list words as verbalized by the instructor then repeated them back to the instructor to ensure correct pronounciation. This was instituted to aid correct pronounciation of words.
2. He was given a taped copy of the list words for the days unit to use as a listening reference while completing his assigned work. This was done in order to provide the student with a personal source of independent reference.
3. The student was required to write out each list word before beginning the exercises. This was done to encourage phonetic analysis of spelling words and provide an opportunity for the improvement of writing skills.
4. He completed the exercises essentially by himself by reading the instructions at the beginning of the exercises, following the directions and writing the answers to the questions as requested. Each exercise provided an opportunity for the student to use the spelling words in a variety of situations, such as, finding meanings (extending vocabulary), phonetic and structural manipulation of words (using generalizations) and direct application of words (including grammar). This students concept of spelling was putting letters in the right order. The exercises expanded this idea by emphasizing the need for correct order of words in

sentences to ensure meaningful communication.

5. This student was required to write the spelling words when tested in order to more fully evaluate the effectiveness of the instructional approach in the spelling remediation.
6. Following a test this student was required to re-write any words spelled incorrectly.
7. This student completed a worksheet each day that was in conjunction with the assigned lesson. The worksheet was provided to reinforce concepts introduced in the lesson units.

Summary and Conclusions

After introducing the lessons to this student he informed the instructor that he had used the "Spelling in Language Arts" series but that the application was different in two ways:

1. He was assigned pages along with his classmates without testing for knowledge first
2. The words for each lesson were not pronounced before the lessons were assigned. They were only pronounced during the test at the end of each lesson.

This student was not enthused about having to use the Spelling in Language Arts series because he had already used the series. However, he was enthused about having a tape of the words available for his use and used it constantly and consistantly. Although all the units were previewed before being assigned this student still encountered difficulties in phonetic analysis of words.

Although this student displayed great amounts of interest at the beginning of the sessions his interest seemed to decrease when confronted with the remediation program. The units from the "Spelling in Language Arts" series did not appear to sustain his interest although he appeared self-motivated during the initial phases of the project. When this observation was discussed with the student he reported that he found the lessons to be boring.

On the final spelling test that consisted of the words used during the remediation this student made 9 spelling mistakes from the list of 36 words. Four of the mistakes were due to having the letters in the wrong order,three of his mistakes had single letters missing,one mistake invoved having an extra letter and the other mistake had a single incorrect letter. These errors remain consistant with the errors made during the assessment prior to the remediation. This student still displayed difficulty with the correct sequencing of letters and still omitted, added and substitued letters when writing spelling words after studying them. He also showed an inability to accurately predict his performance in spelling. He demonstrated inconsistant prediction when asked to indicate during this test what words he knew for sure he spelled correctly and what words he knew for sure he spelled incorrectly. This post remediation test indicates that the "Spelling in

Language Arts" series used in conjunction with a Traditional Instructional approach to teaching spelling was not entirely useful in remediating this students assessed spelling difficulties. Post testing involving all the test instruments mentioned in the methods section did not reveal many significant quantitative differences.

B. Subject 2

This student was aged 11 years 2 months. This student first presented himself as a rather shy young boy who was initially very talkative and seemingly relaxed. He has one older sister. Both parents work on the family farm and were concerned about his spelling problem.

Test Results

Woodcock Reading Mastery Tests,Form A

This student worked very slowly during this test and scores for the most part were below his grade placement. In the "Letter Identification Test" there were a number of reversals notedand errors made in letters of written script. His score on this subtest showed a relative mastery of grade 2.9 which is below his grade placement of 5. The "Word Identification" subtest results were also below his grade placement with a score of grade 2.1 for a reading score and 2.5 for a failure reading score. His weakness in word identification may effect his ability to spell in that he has less words in his memory storage that are easily recognizable in order to spell correctly. His score on the "Word Attack" subtest was also below his grade placement with results showing a relative mastery at grade 2.7 and a failure reading level of 4.2.

Pairs Test of Decoding Skills

For the first subtest, "Initial Consonants", this student was able to quickly give the paired word without having to sound it outloud. He made two errors which included a reversal of letter error. In the succeeding subtests he demonstrated more reversal errors and sounded out each pair rather then generalizing as in the first subtest. In subtest B, "Final Consonants", he scored 11 out of 16 correct with reversal errors and mispronounciations of vowel sounds. In subtest C, "Middle Short Vowels", he scored 8 out of 10 correct. The errors were due to reversing initial consonant letters. He experienced more difficulty with subtest D, "Middle Long Vowels", and "Vowel Digraphs", where he scored 10 correct out of a possible 16. His errors were due to using short vowel sounds instead of the correct long vowel sounds. Long vowel sounds appear to be a phonetic weakness with this student. His errors on subtest E, "Initial Consonant Blends and Digraphs", (18 correct out of a possible 22) were few and inconsistant. The last subtest, "Final Consonant Blends and Final Digraphs" indicated a major weakness with 10 out of 18 correct. Errors included reversals, letter omissions and substitutions. In summary, this assessment suggests that the student relies on a "sounding out" strategy rather then a visual sight word recognition strategy.

Consonant Blends and Digraphs Assessment

The results of this assessment indicated that consonants combined with the letter "l" and "r" pose some difficulty with this student. For example, he would pronounce the blend "pr" as "per". He appeared very good at pronouncing the consonant blends in isolation however he demonstrated difficulty in pronouncing the blends in the context of words. In general, his phonetic skills appeared inconsistant and inefficient.

Informal Alphabet Writing Test

This student was very slow in completing this task. Many of the letters wandered above and below the baseline. Reversals were common with the letters "p", "q" and "z". This assessment indicated poor writing skills and/or unfamiliarity with the alphabet which could create difficulties in spelling performance.

Digit Span Test

The raw scores on this test were within the normal range for his age group. He was able to repeat 6 digits forward then rearrange 7 digits and present them backwards.

For both parts of this test this student used oral repetition of numbers as a strategy for recall.

Visual Attention Span for Letters

During the administration of this test this student used oral recall as a strategy for recall. There were six instances of reversal, 5 of them involved the letter "q" for which he said "p". Occasionally he demonstrated inattentiveness,however, when prompted to attend to the task, this student was able to recall a series of 5 unrelated letters.

Auditory Discrimination Test

This test did not reveal any significant difficulty in this students' ability to differentiate between sounds of words.

Slosson Oral Reading Test

This student did not demonstrate any instances of reversals during the administration of this test. However, the results of this test were consistant with the results of the 'Woodcock" by indicating poor ability in sight word recognition. He frequently attempted to phonetically decode the list words and was generally unsuccessful.

Wide Range Achievement Test

This student sounded outloud each word as he spelled it. His performance demonstrated poor writing skills and a tendency to phonetically spell the words. His grade score for spelling on this test was 2.7.

Spelling of Word Parts

During this test this student used a combination of upper and lower case letters. He demonstrated difficulty with some vowel combinations such as, "oa", ea" , "ou", and digraphs such as, "ies",and "gh". The majority of the blends were written correctly especially the more common consonant blends such as, "st" and "sh".

Diagnostic Spelling Test

This test indicated that this students weaknesses lie with non-phonetic spellings of words, double vowel spellings and words containing "ow" and "ou" combinations.

Schonell Graded Word Spelling Test

This test indicated that this student had a spelling age of 7.0. This test was consistent with the findings of the other spelling tests in that this student spelled phonetically, for example, "ground" was spelled "grownd" and "noise" was spelled "noys".

Language Arts Word Recognition Assessment

This test established a baseline of familiar sight words to be used for the language arts spelling test consisting of familiar spelling words. During this assessment it was observed that this student made many errors on vowel sounds as well as making numerous reversals.

Language Arts Spelling Test

During the administration of this test this student verbalized each word as he wrote it. He wrote most of the words quickly without demonstrating any effort to self monitor his response before proceeding to the next word. Although he was able to recognize and read all the words he was not able to spell them all correctly.

Informal Diagnostic Spelling Assessment,Part 1

During this assessment this students ' spelling strategies became more clear. He constantly mentioned the importance of "sounding words out loud" in order to spell them. He also reported the necessity of knowing the meaning of a word to aid in the spelling of the word. He stated that it is easier for him to know how to spell a word if he can read the word and knows what it means. His study method for learning spelling words incorporates these strategies by reading the word outloud,saying it, giving the meaning and then trying to spell the word from memory. He mentioned that he "sees one letter at a time" when he is spelling a word.

The words he can pronounce are the easiest for him to spell. The most difficult words to spell are the ones that contain silent letters especially vowel combinations. Eventhough he expresses the best method for studying spelling words is for him to write the words down on a piece of paper he said that that the most frequent method used by him is when he studies with a friend by saying each word out loud to each other.

When he was asked to define spelling he explained that it was "putting the letters down in the right order". During this assessment he informed the instructor that he was unable to predict whether he spells words correctly or incorrectly which was evident in the "Language Arts' Spelling Test" where he was asked to indicate his prediction. He also mentioned during this assessment that he feels embarrassed when he is unable to spell a word correctly.

Informal Diagnostic Spelling Assessment,Part 2

This assessment indicated that this student primarily uses a single letter approach to spelling words. He very seldom used letter combinations to form spelling words and when he did attempt to construct words by using grouping techniques it was either inappropriate and/or ineffectual. For example, when he sought letter combinations for the word "tube" it was observed and later confirmed by him that he looked for "tu" then "ub" then "be".

Informal Diagnostic Spelling Assessment,Part 3

On this task this students' strategy for studying spelling words varied from previous expressed or demonstrated methods of studying spelling words. During previous assessments he had shown a preference (verbally) for studying spelling words letter by letter, however, his non verbal performance on this assessment showed a preference for grouping. He did not group all words according to standard decoding practices, for example, grouping by common digraphs or consonant blends, but did indicate knowledge of this type of decoding.

Student Perception of Ability Scale

Generally, this test indicated a positive academic self concept except in the area of spelling. All responses to questions concerning perception of ability in spelling were negative.

Item No.	Question	Response
3	All new words are easy to spell	No
13	I am good at spelling	No
15	I have problems with spelling	Yes
17	I am happy with the way I spell	No
36	I like spelling	No
49	My spelling is always right	No
54	I find spelling hard	Yes

59	I am slow at spelling	Yes
62	I usually spell words right	No

Other Assessment Techniques

Other methods employed with this student to assess spelling strategies included video-taping a peer teaching situation and a self-study session. The self-study session lasted twenty minutes and was followed by a spelling test. Before leaving the observation room the instructor showed the words to the student and pronounced each word for him. It was observed that this student began his study session by reading aloud all of the words. After self-verbalizing the words he covered them and then tried to write them without looking at them. During this session he appeared very restless(moving about in his chair, and stretching) and tired (yawning). He continued the strategy of reading the group of words then writing them down as a group of words for ten minutes then changed to another strategy. He would look at 2 to 3 words that were written on separate file cards, verbalize them, place them face down, spell them outloud and then try to remember where he had placed the word in relation to the others. After finding the word he did not check the spelling of the word before moving on to the other words. He made 5 errors on the spelling test that followed the study session of the fifteen words. Five of the 10 words he spelled correctly were the words that he had written down on a piece of paper during his first study strategy.

During the peer-teaching session this student experienced being both teacher and learner. During the learner stage he was shown the spelling words without them being pronounced and was asked to write them on a blackboard. The peer teacher demanded this student to print neatly and quickly which seemed to frustrate him. When he became the teacher he instructed his peer to sound the word outloud, provide a definition for each word and then memorize the word by looking at it for a few seconds. Although this student had been given the correct pronounciation of each word by the instructor before this session began, he accepted the incorrect pronounciations of his peer and adopted his peers' incorrect pronounciations.

The information gathered from all of the assessments was used for his remediation which was based on a "Direct" teaching approach. The words spelled incorrectly on the 'Language Arts Spelling test' were used for his remediation program (see Appendix A)

Remediation Strategy and Rational

This students' remediation was based on a direct instruction approach. The assessment analysis was explained and he was given information regarding the efficiency and inefficiency of his spelling strategies along with providing him reasons for the importance of spelling The efficient qualities of his demonstrated spelling strategies were incorporated into his spelling program in an attempt to make him a more active participant in the remediation process. His spelling assessment suggested that this student used ineffective strategies while studying spelling words because he never used a consistant approach, therefore, he was provided a structured procedure in order to use the incorporated strategies more effectvely. Standards for written performance were imposed due to his poor writing and his inability to self-monitor his spelling. This student displayed interest in word meaning , hence, his program included the use of a dictionary. The writing of spelling words during study was imposed on this student in order to have his attention focus on the structure of his spelling words and to monitor for frequently occuring reversals (b-d, p-q). This student demonstrated a consistent phonetic approach to studying spelling words and thus was incorporated into the design via a 'look-sound it out' strategy.

The words used in the remediation were grouped according to similar characteristics.

Day 1: Long Vowel Sounds

freeze plain coach
neat mistake explore

Day 2: R-Controlled Vowels, "er" only

perhaps perfect term
helicopter ordered answer

Day 3: R-Controlled Vowels, Non-Phonetic

war return alarm
colour berry airport

Day 4: Contractions and Suffixes

breaking following aren't
knowing I've lively

Day 5: Phonetically Spelled Words

holiday correct problem
mammal branch between

Day 6: Non-Phonetically Spelled Words

knock dozen shown
cattle rifle growth

Procedure For Each Word

1. Look at the word and sound it out.
2. Describe out loud what the word looks like.
3. Write the word on a file card.
4. Write the word in the notebook and check it.
5. Give a meaning for the word.
6. Check the meaning of the word in a dictionary and write it in the notebook.
7. Write the word in a sentence in the notebook.
8. Say the word outloud.
9. Spell the word outloud while looking at the file card.
10. Spell the word again with eyes closed then check the correct spelling of the word. If wrong go back to step

9.

11. Put the card away and spell it in the notebook.

12. Return to step 9 if an error is made.

This procedure was directly presented by the instructor for each word of study. This systematic study plan incorporated some of the strategies preferred by the student in a more efficient manner involving repetition of each word both in written and oral forms. It also utilized a method by which the students' weaknesses in spelling were remediated through his strengths and allowing him to be an active participant even though the program was directed by the instructor.

Lesson Plan

Sound out Word This step was instituted to reinforce decoding skills and phonetic analysis of the word. Direct instruction provided an opportunity to correct any errors and any other assistance that was needed by the student.

Describe What the Word Looks Like During this step the student was instructed to look at the graphic representation of the word (for example, two letters have a vertical stem and another decends below the line). The aim was to have the student attend more closely to the configuration of the word in order to enhance his visual memory.

Write the Word on a File Card and Check It This step was included in the program because it was observed in the assessment that this student did not consistantly write the word as a study strategy. He usually only sounded the words outloud and then verbalize the individual letters. However, this strategy was also inconsistant. Checking the word was instituted in order to reinforce self-monitoring.

Write the Word in the Notebook and Check It This step reinforced the need to write the words down repeatedly in order to reinforce his visual memory. It also reinforced attention to the task along with providing another self-monitoring check on the correctness of the spelling.

Give a Meaning for the Word This step allowed for the inclusion of one of the students' preferred strategies. He had previously mentioned that knowing the meaning of a word aided his spelling performance. Even though this strategy does not directly influence correct spelling performance it does make the spelling task more meaningful and thus facilitates meaningful learning.

Check the Meaning of the Word in the Dictionary This step further reinforced his need for meaning and gave him more experience in seeing the word in another context and reinforcing his visual memory of the word.

Write the Word in a Sentence This step was included to make the task of spelling study more personally meaningful by stressing the importance of correct spelling in the context of sentences in order for the reader to know exactly the meaning of the writers' message. It also provided more practice towards improving his writing performance.

Say the Word Outloud This step was included to further reinforce the correct pronounciation of the spelling words along with providing more focus on the letter sound correspondence of the word. It was also included as another way of incorporating one of his preferred strategies within the program in order to reinforce his active involvement. It reinforced his rational that "if he could sound a word he could spell it."

Look at the Word and Say it Outloud This step allowed for further attention to letter sound correspondences within the word along with giving him repeated exposure to the visual pattern of the word. It also reinforced his preference for spelling words outloud.

Spell the Word with Eyes Closed This step was included to reinforce his visualization of the word along with demanding attention on the task. Concentration was enhanced by stipulating a return to a previous step if he incorrectly spelled the word. Positive verbal reinforcement followed a correct spelling of the word in order to induce a feeling of self accomplishment.

Put the Card Away and Spell it in Notebook This step reinforced the need for this student to write the word as he studies it along with providing another method of ensuring self-monitoring the correctness of his spelling performance before advancing to another word of study.

Compare Written Word with File Card This step was included as a follow up to the previous step so the student would be guided towards monitoring his performance with a reliable comparison.

Return to Step 9 if Any Error is Made This final step concluded the procedure for studying spelling words as directed by the instructor and was used to provide a criterion standard for the student to accomplish before being considered ready for studying the next word.

This procedure was used for every word the student was expected to study during the research project. After he had completed the daily list of words the instructor tested him on the studied words. The student was then instructed to correct his own test by using the file cards. This was done to reinforce the students' active participation and provide a means by which the student could monitor his mistakes.

Summary and Conclusion

During the remediation this student continually displayed neater printing and a sense of pride for the work he accomplished. He seemed to enjoy using the dictionary in locating the spelling words and giving the stated meanings as well as writing sentences that included his spelling words. As the lessons progressed he began to recall the steps of the spelling procedure spontaneously and sometimes requested to work on the spelling procedure by himself. When ever he made a spelling error during the proceedure and was instructed to go back to step 9 of the program he appeared visably upset.

At the begining of the program lessons this student worked slowly and methodically. However, as the lessons progressed he he began to set his own standards for his work, for example, he would sometimes discard a file card in order to reproduce another file card with neater writing. He also became more studious with respect to word definitions such as suggesting that "breaking" was synonymous to "splintering" and "shattering". As he became more proficient in describing words he also improved his ability to identify the orthographic nature of his spelling words by isolating trouble spots within words such as non-phonetic vowel sounds.

On the spelling test that followed remediation this student made 22 spelling mistakes from the list of 36 words. Even though his writing performance improved and his misspellings were graphically similar to the correct spellings, many of his errors correlated with the types of errors produced during the assessment segment. Specific difficulty was still associated with vowel combinations and r-controlled words. He was also unable to more accurately predict the correctness or incorrectness of his spelling performance during the spelling test. Performance on the other post-tests produced a little quantitative difference (see Figures 1&2). For example, letter identification increased from 38 to 39, word recognition increased from a raw score of 59 to 73 and word attack raw scores increased from 22 to 29.

Generally, the direct instruction approach offered this student a consistant and structured program strategy for studying spelling words which seemed appreciated by this student. Some of his reactions to the procedural design include: "It's fun and not boring like school", this proceedure taught me "to spell better,how to learn and how to follow directions;---By George, I think I've got smarter!", "The procedure helps me study a lot more so it will help me better," and "It could be used in reading as well."

C. Subject 3

This student was aged 11 years 6 months. He was interested in being part of the program and was a cooperative subject However, he did refuse to participate in one suggested assessment activity involving peer-teaching. He would not comply with the suggestion because he was insecure about his ability and did not like the idea of teaching. His request to omit this activity was granted and he complied with all other assessment requirements.

Test Results

Woodcock Reading Mastery Tests,Form A

The "Letter Identification Test" did not reveal any specific difficulties in this area. This students' score on the "Word Recognition Test" indicated that he was operating approximately two years below his grade level. His performance on the "Word Attack Test" indicated an approximate two year lag with specific phonetic difficulty involving the "kn" and "qu" letter combinations.

Pairs Test of Decoding Skills

This student did not demonstrate any significant difficulty in this test.

Consonant Blends and Digraphs

This student performed adequately on all the letter combinations except "qu" which is consistent with the results from the Woodcock and also exhibited a weak "l" sound.

Informal Alphabet Writing Test

This student was able to write all the letters of the alphabet without difficulty.

Digit Span Test

This students' scores indicated normal ability in short term recall of number sequences. His better performance on repeating forward sequences of numbers than on backward sequencing of numbers indicates a greater skill in retaining and verbally reproducing a fixed set of items then retaining a sequence of items and mentally remanipulating this sequence into another desired response.

Visual Attention Span for Letters

This students' score on short term visual memory indicated that he was operating within a satisfactory range of ability. Although his score of 5-2 places him at a mental age of 10.0 the qualitative analysis did not suggest significant difficulty with rote-memory of unrelated letter sequences (see Fig. 1).

Auditory Discrimination Test

This screening test for auditory discrimination problems did not reveal any difficulties in this area.

Slosson Oral Reading Test

This students' score indicated that his sight word recognition was in the average range of ability. However, this assessment was considered invalid after the completion of the task. The instructor allowed the student to phonetically decode the words instead of limiting the student to immediate responses which is the standard procedure. Hence,the results were inconsistent with the Woodcock which indicated a lower level of sight word recognition ability.

Wide Range Achievement Test,Spelling

The score on this test indicated that this student was operating approximately 2 to 3 years below his grade level. During this assessment it was observed that this student used a 'sound-search for the appropriate rule' method of spelling. It was noted that he silently sounded out each word then spelled each sound as he verbalized it. On a few occassions he orally debated (whispered) which rule would be appropriate in spelling a particular sound. It was also observed that this student monitored his spelling performance inconsistantly and inefficiently. He would casually check his spelling words immediately after writing them and failed to self check other spelled words, instead of carefully checking all of his spelled words thoroughly.

Spelling of Word Parts Test

During this test this student demonstrated particular difficulty with the spelling of "kn" and "gh" sounds.

Diagnostic Spelling Test

This test indicated that this students' spelling ability was approximately 2 years below his grade level. Specific difficulties included the spelling of the "oo" sound, vowel-r combinations, changing the final "y" to "i" before adding the ending, contractions and non-phonetic spellings. During this test it became more evident that this student was extremely rule conscious. During the spelling test he would verbalize one or two rules when attempting to spell difficult words and then would make a decision on which of the verbalized rules would best be applied. However, he did this inefficiently most of the time due to his seemingly limited knowledge of rules, inability to recognize when a rule may be inappropriate for a word, and his insufficient number of rule choices. For example, when confronted with a word that produced a long "e" sound he would say "two vowels together, could be spelled "ee", "ea"." Then would simply record the first choice that came to his mind.

Schonell Graded Word Spelling Test

This test suggested that this students' spelling age was 8.2. Specific difficulties were substituting "i" for "e" and "e" for "i" in short vowel sounding words. He also substituted "d" for "t" and "t" for "d" along with having difficulty with vowel-r combinations.

Language Arts Word Recognition Assessment

This student made few errors on this sight word recognition assessment. As with Subject 1 and 2 the familiar sight words were used to develop the spelling list for the Language Arts spelling test.

Language Arts Spelling Test

This test provided for a list of misspelled familiar words. It also indicated that this student was unable to consistantly predict the correctness or incorrectness of his spelling performance.

Informal Diagnostic Spelling Assessment,Part 1

During this assessment this student indicated that the importance of spelling was to be able to secure a "good job" in the future. He also associated good spelling with reading skills and reported that he feels embarrassed when he is unable to spell a word correctly. He stated that he considers the middle part of words to be the most difficult to spell and that spelling primarily requires memorization. He mentioned that it is very important for him to be able to see the word before being able to study it properly and that if he is not directed to study spelling words he will not apply much time to the task. He also reported that he requires a quiet area in order to study spelling and that he doesn't feel very competent in the task. He mentioned that he primarily studies spelling words by using a letter by letter method and when it comes time to spell the word on a test he often tries to associate a phonetic rule to assist his recall. This student also reported during this assessment that he seldom writes his words when studying spelling words since he prefers to verbally memorize the letters of the word and its' appearance.

Informal Diagnostic Spelling Assessment, Part 2

During this test the student demonstrated a preference for spelling words letter by letter rather then by grouping common letter combinations such as consonant blends and digraphs. It was also observed that the student seldom monitored his spelling with the correct spelling of the word that was written on the file card but would rather rely on his visual memory of the word and then correct any errors after constructing the spelling of the word. This resulted in quick constructions that contained spelling errors.

Informal Diagnostic Spelling Assessment, Part 3

During this assessment the student showed a preference for studying words letter by letter,however, occasionally he would demonstrate a grouping method which was generally appropriate. For example, for some words that began with consonant blends he would sometimes choose to study this word by grouping letters according to phonetic rules, i.e. gr oa n , or separate other words according to appropriate methods,

for example, need ing. He stated that if he is given a word orally such as in a spelling test and is unable to see the word or was unable to have studied it beforehand, he would separate the word into sound groupings to aid his spelling performance. He added that if he thought that the sound groupings were inappropriate he would sometimes break the word into a root word and ending if he felt comfortable with the base word.

Student Perception of Ability Scale

This test indicated that this student has an essentially positive academic self concept with the exception of spelling. All responses to questions about perception of ability in spelling were negative.

Item No.	Question	Response
3	All new words are easy to spell	No
13	I am good at spelling	No
15	I have problems in spelling	Yes
17	I am happy with the way I spell	No
36	I like spelling	No
49	My spelling is always right	No
54	I find spelling hard	Yes
59	I am slow at spelling	Yes
62	I usually spell words right	No

Other Assessment Techniques

This student like the other students in this study was shown a group of 15 words by the instructor. The words were printed on file cards and pronounced for the student by the instructor. When the student was familiar with the words the instructor left the student and informed him that when she returned he would be given a spelling test on the words. This situation was observed through a one-way mirror and also video-taped. It was observed that this student proceded to study the spelling words when the instructor left the room and that he used a specific study method. After observation and discussion the following steps in his initial study methods were

1. Look at the word
2. Say the word (the observations indicated that he did this inconsistently)
3. Say the letters of the word (the observations showed that that he did this orally, however, after questioning he mentioned that he prefered saying the letters of the word to himself silently).
4. Look away from the word and memorize the word letter by letter. When asked about this step with respect to what memorizing meant to him, he replied, "You see the whole word in your mind then memorize it by saying it letter by letter, over and over again.
5. Check to see if it is spelled correctly.It was observed that this student often failed to exercise this step and would more often proceed to the next spelling word after trying to memorize it.

It was observed in this video-taped session that this student did not write any of the spelling words as a method of study. This student also reported that he very seldom writes his spelling words as a means of studying them in or outside the classroom. When probed (see Appendix A) about how often, when and where he studied spelling words he stated that he spent very little time studying spelling and that he only studied words he felt were difficult.

Remediation Strategy and Rational

This students' remediation program was based on the self-instructural (CBM) design that was described in the methods section. This student was generally informed of the analyzed results of the assessment which included an explanation of the importance of spelling and the efficiency and inefficiency of his methods of studying spelling words as it related to his performance. This method incorporated some of his existing strategies and strengths into his spelling remediation with a more diciplined and structured format which included the student as an active participant with respect to the remediation proceedure and its' design. Although it was anticipated that the (CBM) design would have to be modified to meet the needs of the student following the assessment, it was concluded that the program did not need to be changed to meet the needs of this student because it utilized many of his existing strategies. Furthermore, it encorporated others that would allow this student to study his words more efficiently. However, one component was added which will be described later.

The "Student Perception of Ability Scale" indicated that this student had a low academic self concept with respect to spelling. The CBM procedure focusses on this area by incorporating a self-reward component. This student demonstrated a preference for studying words letter by letter which was accomodated by the CBM method. The inclusion of this strategy reinforced this students' participation in the remediation procedure and was consistent with the assessment that suggested a relative strength in this area (Digit Span, and the Visual Attention Span for Letters). Previous assessment also indicated that this students' study strategies were inefficient and inconsistent which was accomodated by the CBMs' step by step structured,and consistent approach. This student demonstrated a use of covert and overt verbalizations to aid his study of spelling words as well as a self-checking strategy. However, he did not employ these methods consistently, hence, the CBM method coincided with his strategies but in a more consistent way. This self-instructional spelling study program also demanded that the student consistently write his spelling words which was a strategy that was not employed by this student.

Generally, this remediation program encouraged active participation both in its' design and in its' practice. It incorporated some of the students' already existing study methods along with some strategies that were considered useful and not in his repertoire such as monitoring his studying and writing his words in a meaningful context.

In order to provide a program that allowed the instructor to more efficiently monitor this students' effectiveness with this approach one component was added. At the conclusion of each unit of words studied by the student, the instructor gave the student a spelling test in order to ascertain a measure of student success with the self-instructional proceedure. If the student made an error on the spelling test, the instructor informed the student that it would be added to the list of words to be studied during the next session.

Lesson Plan

This student was randomly assigned 6 words a day to study for six days. When he completed the unit of words each day his work was finished.

The words were grouped as follows:

Day 1:	freeze	holiday	breaking
	correct	knock	answer
Day 2:	mistake	problem	shown
	explore	dozen	following
Day 3:	aren't	between	mammal
	growth	coach	berry
Day 4:	I've	knowing	ordered
	branch	colour	helicopter
Day 5:	claim	perhaps	lively
	alarm	neat	war
Day 6:	cattle	rifle	perfect
	term	airport	return

This student was trained in the use of the self-instructional (CBM) approach and used it for each days' group of words. He was provided a written script of the procedure for initial reference which became an unnecessary aid after day 1. He was closely monitored by the instructor who intermittently provided external reinforcement such as "You're doing very well" and "Keep up the good effort". However, after the first two days the student appeared self-motivated and enjoyed his self-reinforcements which was concluded from such statements as "This is fun", "I like this" and "I don't need anyones' help.

Summary and Conclusion

It was observed during the assessments that this student mentally performed word searches when asked to spell a word of which he is unfamiliar. He mentally tried to find a category of words or examples of words that compares to the word he is attempting to spell. This was observed during the "Woodcock Word Attack Test", the "WRAT", the "Diagnostic Spelling Test", the "Schonell Graded Word Spelling Test", the "Spelling of Word Parts" test, and the "Language Arts Spelling Test". It was also reported to the instructor by the student during the "Spelling Diagnostic Cognition Assessments, Parts 1,2 and 3. This was exemplified when he tried to find the "kn" spelling in a word that had a "n" sound, or when he tried to reproduce examples of words that had the "ee" sound in the medial position. This method was applied inconsistantly and was only occassionally successful.

This student often demonstrated a rehearsal strategy when spelling words. When he attempted to spell a word that was particularly difficult he rehearsed previously learned rules. He would try to search for the applicable rule in context with the word that he had been given to spell. This was observed in the "Diagnostic Spelling Test"(i.e.He would recite the rule out loud "drop the "e" and add "ing"), the "Woodcock Word Attack Test"(i.e. "when "kn" are together,the "k" is silent") and reported to the instructor during the "Spelling Diagnostic Cognition Assessments Part 1,2,and 3."

This student would also incorporate a rhyming strategy when asked to spell some words. For example, he would focus on the final sound of a word , then using a word search with a rhyming strategy, he would look for for a word that sounded the same as the word to be spelled, such as in the word "employ",he would verbalize,"boy", "toy" and "joy" and then stop when he either ran out of rhyming words or felt that he knew how to spell the word. When he was asked to spell the word "bought" he searched for a comparison word and announced the word "thought" which allowed him to correctly spell the word "bought". However, in the "Diagnostic Spelling Test" when he was asked to spell the word "brought" he used the previously described strategy and used "thought" as a guide, but did not attend to the "r" sound in "brought" and consequently spelled it incorrectly "bought".

This student sometimes self-checked and self-corrected his work but did it inconsistantly. It was observed and reported to the instructor that he would not self-check a word when he thought he was sure of its' correct spelling or when he had used one of his previously mentioned strategies.

During the assessment this student demonstrated primary reliance on a phonetic analysis of spelling words. He sounded out the whole word (whispers), then its' parts, then wrote each word part as he sounded it out. This was observed during the administration of the 'WRAT' in spelling, the 'Diagnostic Spelling Test', the 'Schonell Graded Word Spelling Test' the 'Language Arts Spelling Test' and during the administration of the 'Informal Diagnostic Spelling Cognition' assessments. He reported particular reliance in the use of the phonetic strategy when the spelling words were unfamiliar to him (for example; when he did not possess some mental image of the word, or when the words were particularly long and contained ,for instance, more then one consonant blend , dipthong or digraph.

The specific areas of spelling weakness for this subject were:

1. Particular difficulty with attending to and spelling medial sounds in words in comparison to his performance on initial and final sounds.
2. Confusion with respect to consonant vowel-r controlled words. For example, when he was given the words "search", "curdle" and "turtle" to spell he wrote; "srerch"- "srirch"- "srurch", "crerdle", "crirdle"- "crurdle"- "crerdle", and "trerdle"-"trirdle"- "trurdle".
3. Particular difficulty with the following letter

combinations when spelling words , "oo", "wh", "kn", "qu", "ur", "ou", "le", "ies", and "gh".

The post-tests excluding the spelling test involving the remediation words did not indicate much quantitative improvement. However, qualitative improvements were observed. His academic self-concept with respect to spelling appeared more positive. This was indicated when he was asked midway into the program how well he had done with a group of spelling words , and he replied, "Well, they're all right again!". Before the final spelling test on all of the words he had studied he was asked how well he thought he might do on the test and he replied,"I'm going to get them all right!". During the middle of the remediation program this student asked if he could be given words outside the list words "Like grade 7,8,or9 words." His aim was to test the system; to see if it could be effective with higher level words. Higher level words were selected from grade 6 and 7 spelling word lists and were given to him as extra words upon completion of the program words. After studying these words he was tested on them the following day and he spelled them all correctly.

This students' appreciation of the self-instructional study plan partly reflected its' format. When the program was introduced to him and modelled for him he commented that "Its' a lot like what I do! This is easy!" This student did not have any difficulty following the modelled example. He was able to remember each of the steps in its' correct order by the fourth session. Before this time he had been following a written guide. He was careful and precise in completing his tasks while challenging himself to accomplish the lists of words in a shorter time frame. This was evident when he said,"How long did it take me today? It's taking me less time everyday isn't it?" He was able to reduce his time from 2 to 5 minutes per session until he reached the twenty minute time period which remained constant for the duration of the program.

He did not object to the use of the covert and overt verbalizations and showed no difficulty with them. He said that he understood why it was necessary and did not feel awkward about doing the task. When he was asked how he felt about it,he said, "I don't mind". He appeared to enjoy the self-reward element of the design which was evident in his behavior. He would grin to himself and often changed the "reward word" from "good" to "great" to "right again" to "very good". As the sessions continued this student became more creative in his sentence compositions. For example, he demonstrated delight in creating an interesting or funny sentence from his words and became anxious for the instructor to read his sentences. This was considered a positive development due to his past avoidance of writing and the uncomfortability he had expressed with respect to writing tasks. There were two days that this student was required to include more words to his list of study due to errors on the previous day. This occurred on day 4 when one word was added to his study list and on day 5 when 3 words were added to his study list.

On the final day of the spelling project this student was administered a final spelling word list test which was composed of the 36 words used during the remediation sessions. His final score was 35 correct out of 36. As on the pre-test he was asked to predict the outcome of his work. This student was able to predict with 100% accuracy which words he thought he spelled correctly and which ones he thought he spelled incorrectly.

Research Questions

The following section is assigned to answering the investigative inquiries related to the spelling strategies of the subjects and the relative effectiveness of the three instructional approaches used in this study. This section entails four parts in accordance with the four major areas of examination.

Research Question 1

The first question was addressed to whether the subjects of this study possessed spelling strategies and whether these strategies were efficiently or inefficiently employed. The answer to this question will be done by identifying each subjects spelling metaknowledge and cognitive strategies (which were evaluated during the initial assessments prior to treatment) followed by an analytical description of the effectiveness of their strategy employment.

Subject 1, MetaKnowledge and Strategies

This subjects' strategies and metaknowledge consisted of:

1. Say the word outloud (strategy)
2. Write the word several times while saying the word outloud. This was done in order to remember the visual patterns of the words and relate it to the sound of the word (strategy and metaknowledge). Middle parts of the words and the sequencing of letters were the most difficult task parameters (metaknowledge)
3. Only studies words he doesn't know (strategy)
4. Studies words by rehearsing "letter strings" (strategy)
5. Phonetically decodes words that have irregular orthographic patterns (strategy)
6. Looks for meanings of words in dictionary (strategy and metaknowledge)
7. Knows when he has spelled a word incorrectly (metaknowledge)

This student verbalized his spelling metaknowledge when probed. His strategy employment was observed over the assessment sessions and supported by his verbal reports. His spelling performance appeared influenced by the inconsistant and inefficient use of his spelling strategies. For example, eventhough this subject identified medial positions of words and letter sequencing to be the most difficult area of spelling for him he only rehearsed word names and not the individual letters. Furthermore, it was observed that no additional study time was allotted to this particular difficulty compared with the time spent on other areas of focus. This subject reported that he only studies words that are unfamiliar to him or causing him difficulty which is supported by Fitzimons and Loomer (1977) as being an effective approach,however, he is unable to accurately predict word difficulty. Therefore, this strategy is inefficient. It was observed that he used a phonetic approach to studying more difficult words , however, due to his assessed weakness in decoding skills this strategy is essentially ineffectual. Occassionally, this subject rehearsed letter strings, however, he did this inconsistantly. This weakness supports Bauers' (1977) suggestion that many poor spellers have less ability in recalling letter strings. Hence, this subjects' inconsistant use may be due to an inefficient recall strategy. Additionally, this subject worked much to quickly which seemed to influence his ability to benefit from some of his strategies. Furthermore, he mispronounced many of his words and failed to monitor his study performance.

Subject 2, Metaknowledge and Strategies

This subjects' strategies and metaknowledge consisted of:

1. Saying each letter outloud while he wrote the spelling word in his notebook (strategy)
2. He reported that it was important for him to know the meanings of words in order to enhance his spelling performance (metaknowledge)
3. This subject displayed both a "grouping" and "letter by letter" approach in studying spelling words (strategy)
4. He often tried to study his words by memorizing them, hence, strengthening his visual representation of each word (strategy)
5. Spelling to him meant "putting letters in the right order" (metaknowledge)

This student verbalized his spelling metaknowledge when probed. His spelling strategies were observed throughout the assessment sessions and supported by his verbal reports.

Many of his strategies were inefficient and/or ineffectual due to his delayed sight-word recognition and phonetic skills. His strategy employment was also influenced by vowel confusions, mispronounciations, letter reversals and slow writing style.

Essentially, this subjects' strategies were used inconsistently and were ineffectual and/or inefficient due to his spelling weaknesses and narrow sense of task parameters. For example, sometimes he would rehearse letter strings and other times he would try to phonetically decode the spelling words. However, due to his assessed difficulty with both phonetic and non-phonetic sounds, his phonetic approach was ineffectual. He often wrote the spelling words he was going to study into his notebook without checking them with the correct spelling and therefore sometimes rehearsed poorly encoded information. This is consistant with Mann et al., (1980) who reported that rehearsed strategies are important in spelling. Most children use this strategy to some extent, however, in some cases they may be rehearsing poorly encoded information.

This subject seldom monitored his spelling performance. He could not accurately predict the correctness of his spelling performance nor assess his particular areas of weakness. Furthermore, he did not consistantly sound out his study words or search for word meaning even though he expressed the necessity of these steps for spelling success.

Subject 3, Metaknowledge and Strategies

This subjects' strategies and metaknowledge consisted of:

1. Look at the word (strategy)
2. Say the word (strategy)
3. Say the letters of the word (strategy)

4. Memorize the word letter by letter (strategy)
5. Check the spelling word with the correct spelling (strategy)
6. Middle parts of words are the most difficult (metaknowledge)
7. Successful spelling performance is dependent on memorization (metaknowledge)
8. Use phonetic approach with words that are more difficult (strategy)
9. Search for spelling rules when given unfamiliar spelling words (strategy)
10. Visualizing words aid recall (strategy and Metaknowledge)
11. Rehearse letters of words (strategy)
12. Use categorical word search to find analogy words in order to aid spelling performance with more difficult words (strategy)
13. Spelling is important for securing future employment (Metaknowledge)

This subject verbalized his spelling metaknowledge when probed. His strategy employment was observed over the assessment sessions and supported by his verbal reports.

This subjects' spelling performance seemed influenced by the inconsistant and inefficient use of his spelling strategies. His strategies were also limited by his delayed sight-word recognition, phonetic skills, storage of spelling rules, difficulty with rule exception words, his preference for working too quickly, negative perception of ability in spelling, and his lack of motivation for studying spelling independently.

This subjects' stategies were essentially appropriate, however, he often omitted some of the strategies he considered important and failed to use others consistently and effectively. For example, this subject did not always say his spelling words outloud and sometimes mispronounced them. He did not consistantly check the correctness of his spelling while studying his spelling words. He did not always rehearse the individual letters of each word and would often phonetically decode words incorrectly. He was often successful in recalling analogus words to aid in the spelling of more difficult words, however, he would sometimes spell the object word incorrectly due to his failure to discriminate the differences between analogus words and object words, focusing only on similarities. This student was very "rule conscious" when faced with difficult spelling words, however, due to his limited storage of rules and reliance on the correctness of the first rule that came to his mind, this strategy was sometimes ineffectual. Most importantly, this subject never wrote his spelling words as a strategy to aid his recall. He preferred to study the words mentally. Furthermore, he never monitored his study performance and was unable to predict the correctness of his spelling performance.

In summary, from these subjects' metaknowledge their strategic spelling behaviors indicates a basic understanding of the task parameters for spelling study. They were able to select, verbalize and demonstrate skills and preferred strategies related to spelling, however, they were inappropriately and/or inconsistantly and/or inefficiently used.

Research Question 2

This study involved the development of a self-instructional spelling program that was modelled from the cognitive modification design popularized by Meichenbaum and Goodman (1971). The purpose was to discover whether a student could be taught a strategic design that would be controlled by the subject which would lead to the aquisition and maintenance of spelling familiar words that were previously misspelled.

Essentially, the self-instructional proceedure used in this study was beneficial for learning and maintaining familiar spelling words. The self-instructional design was accepted by the subject which could have reflected his comfortability with the procedure. The subject who used the procedure followed the design precisely as it was modelled and appeared confident and pleased with its' effectiveness. He performed the required overt and covert verbalizations without reluctance and did not demonstrate any awkwardness or uncomfortability with this demand. He consistantly self rewarded, self-assessed, self-evaluated and self monitored his spelling performance along with successfully completing all of the written requirements. The last point is especially noteworthy due to this subjects' reluctance to perform a writing strategy in studying spelling words. Although an increased perception of ability in spelling was not revealed on the "SPAS" posttest, the instructor considered his academic self-concept with respect to spelling to be increasingly more positive as the study progressed. This was indicated by statements such as "I like this spelling method" and "I don't think I will have any trouble with spelling now". Furthermore, this subject has continued to use this procedure independently both at home and at school according to parent and teacher reports obtained two months after the completion of the summer project. His parents have stated that the program appears to influence a more positive self-regard with respect to spelling ability and that he appears more motivated and confident in his spelling performance.

On the final spelling test that was comprised of 36 words used during the remediation segment of his program this subject made one spelling error. This achievement has qualitative significance when compared to the achievement of the other two subjects on the final spelling test. Subject 1 made 9 errors and Subject 2 made 22 errors and both subjects were unable to consistently predict which words they spelled correctly and/or incorrectly. However, Subject 3 indicated confidence in his performance on the 35 correctly spelled words and was able to correctly predict the incorrectness of his one misspelled word which was not possible prior to intervention.

In summary, this subject was able to learn the self-instructional method for studying familiar spelling words which lead to both successful and accurate prediction and spelling performance. Further support for the ability to teach a self-instructional design that is controlled by students and improves spelling performance and prediction comes from a pilot study done with this design during April 1983 at a school outside Edmonton,Alberta. A special education teacher taught the self instructional design used in this study to two learning disabled students who were having significant difficulty in spelling. The students were 10 and 11 years of age. The results of this pilot study showed a significant increase in spelling performance and prediction by these students on familiar spelling words. These students are still using the selfinstructional design independently both at home and at school 7 months after completion of the pilot study with continued success. This teacher has since instituted this design with 14 other learning disabled children who are experiencing spelling difficulty within her classroom. Three months from its' inception all of the students aged 9 to 11 are using the self-instructional design independently. The teacher has monitored their progress and has reported better spelling performance , increased motivation, more spelling interest and confidence along with better spelling prediction ability with all of her students.

Research Question 3

Differences in spelling achievement were found between the three subjects on the follow up spelling test (Remediation SpellingTest)that was administered immediately following the remediation programs. The results showed that the subject who followed the self-instructional approach demonstrated the best achievement. However, due to individual differences with respect to spelling strengths and weaknesses, slight age differences, motivation, attention and teacher effects that were not controlled the specific reasons for post test differences are difficult to ascertain. The results showed that Subject 1 spelled 27/36 familiar words correctly, Subject 2 spelled 14/36 words correctly and Subject 3 spelled 35/36 familiar words correctly. In light of these results it appears that the self-instructional (CBM) approach produced better spelling performance followed by the traditional and the direct approaches. However, the results from the pre-remediation assessments suggest that Subject 1 who received the traditional approach to spelling had more ability in letter identification, word identification and word recognition than Subject 2 who received the direct approach. Furthermore, Subject 1 obtained higher scores on the pre-remediation spelling measures (WRAT, Schonell) compared to Subject 2. Hence, Subject 1's better performance on the post "Remediation Spelling Test" (see Figure 2) compared to Subject 2 might have been a function of superior ability in spelling along with a greater ability in letter identification, word identification and word recognition rather than as a result of the remediation approach. Post-assessment results (see Figure 2) suggest the possibility that Subject 2's instructional approach might have improved his letter and word identification ability along with his word attack ability where as Subject 1's relative ability in these areas generally remained unchanged.

Subject 3's pre-test results generally indicated superior ability in word attack and word recognition compared to Subject 1 and 2. Additionally, Subject 3's pre-assessment results on the spelling measures (WRAT,Schonell) were better than Subject 2 and lower than Subject 1. Hence, Subject 3's pre-remediation ability might have been the reason for obtaining the best results on the "Remediation Spelling Test" compared to Subject 2 but not necessarily with Subject 1. Even though Subject 3's performance on the pre-assessments were generally better than Subject 2 and his spelling achievement appear similar to Subject 1 in both the pre and post assessments as measured by the WRAT and Schonell his improvement in word recognition and word attack suggests the possibility that his remediation approach helped him more in these areas than Subject 1 since his scores in these areas remained generally the same. Furthermore, Subject 2 who had the direct approach also improved his performance in letter identification, word identification, word attack and word recognition which suggests that his remedial program might have also been influential in these areas.

Due to the previously mentioned uncontrolled variables these hypotheses are difficult to substantiate by comparing the pre and post results from the assessments, hence, a more qualitative anaylsis is needed. The qualitative comparison of the three teaching approaches in the next segment suggests tentative reasons for the differences found in spelling achievement between the three subjects.

Research Question 4

There were qualitative differences found between the self-instructional, direct and traditional approaches to spelling across the three subjects.

This study was based on Torgessens' (1977) conceptual framework that encourages the exploration of interactions between the subjects' knowledge of the various task parameters in studying spelling and their performance on the task. It also considered Adelmans' (1971) conceptual notion that by manipulating teaching approaches the interaction between instruction and learner could be examined.

The assessment of spelling skills, observation of strategy employment and the probing of the subjects' strategy awareness and useage within a metacognitive framework aided the instructors' role in developing the spelling approaches used for achieving better spelling ability.

The major focus was to teach students who were provided the "Direct" and "Self-instructional" approaches to use knowledge about the spelling task and be active participants in the planning, regulating and monitoring of their spelling/ thinking activities (Babbs & Moe,1983). The subject that was assigned the "Traditional" approach to studying spelling was not similarly included as an active participant in his remediation program due to the operational definition of this approach that characterizes it as being a "receptive learning" vehicle rather then an approach that includes the learner as an active agent in the remediation. This was done to more clearly differentiate the "Traditional" method from the "Direct" method and to more clearly assess the qualitative effects of being "actively" involved versus not being actively involved during the spelling remediation.

Due to the number of uncontrolled variables that were previously mentioned it is difficult to make a generalized statement about the effectiveness of each teaching approach along with how they compare with each other. However, two major findings are noteworthy. First, the best test results were achieved by the subject who was taught the self-instructional approach for studying familiar spelling words. Secondly, the two most favorable approaches as judged by the subjects were the "Direct" and "Self-instructional" approaches. Subject 1 reported that he felt that the "Traditional" approach was "boring" and seemed to negatively influence his motivation and interest in the remediation segment of the project. Although he made only 9 errors on the remediation spelling test, they were all similar types of errors that occurred in his spelling errors during the pre-tests. Furthermore, he was unable to improve his prediction ability with respect to spelling performance. His work habits, attitude toward spelling, perception of ability did not seem to be positively influenced by his remediation program. The only enthusiastic response came from the instructors' personal involvement with him and the provision of a tape recorder that allowed him to independently review the correct pronounciation of his spelling words. This tape recorder was used consistently throughout his remediation program.

By comparison, Subject 2 referred to the "Direct" instruction as being "fun" and "not boring". He also perceived it as being beneficial for future study both for spelling and for other subjects as well. Contrary to Subject 1, this subject seemed to become increasingly motivated and interested in his spelling activities. He displayed more pride in his work, neater printing and began to set higher standards for his own performance along with showing an increasing desire to study the spelling words independently. This was exemplified by his ability to recall the steps of his proceedure spontaneously with constant requests to work on his own. He also showed more proficiency at identifying particular orthographic patterns within words and isolating trouble spots in words. Eventhough his misspellings on the final spelling test were more graphically similar to the correct spellings compared to pre-tests many of his errors correlated with the types of errors produced during the assessment segment. For instance, there was still evidence of his difficulty with vowel combinations and r-controlled words. Furthermore, he was also unable to more accurately predict the correctness or incorrectness of his spelling performance during the final spelling test. Nevertheless, the direct instruction approach seemed appreciated by this subject.

Subject 3 like Subject 2 appreciated his method of instruction and enjoyed the best success with respect to the number of words spelled correctly on the final spelling test. He also improved his prediction ability with relation to his perception of performance on each word. He became more enthused, motivated and interested with his selected procedure as the remediation sessions progressed. For example, he tested the effectiveness of the procedure with higher level words, challenged himself to complete the daily list of words in a shorter time frame, enjoyed rewarding himself, demonstrated delight in creating interesting or funny sentences with his spelling words and remarked about the confidence and comfortability he felt in using the self-instructional design. He spelled 35/36 words correctly and was able to accurately predict which one was spelled incorrectly.

Generally, the qualitative comparisons suggest that the subjects who were allowed to be actively involved in their spelling programs enjoyed the remediation more. who was not allowed to be an active participant. Comparing spelling achievement, it appears that Subject 3 was the most successful followed by Subject 1 and then Subject 2. However, attributing success to the instructional approaches is difficult because of the uncontrolled variables. Nevertheless, Subject 3 seemed to learn more efficiently under the self-instructional procedure. Subject 2 and 3 followed their procedures more carefully with more attention, interest, and motivation then Subject 1.

In conclusion, the results of this study support the view that children have spelling strategies however, with respect to the children in this study they are too limited, inconsistantly and inefficiently used. This study proved that students can be taught a self-instructional design that is controlled by them that will lead to the aquisition and maintenance of correctly spelled familiar words. A follow up spelling test immediately following spelling remediation revealed that the subject who used the self-instructional design spelled more words correctly then the subjects who were assigned a direct and traditional approach and was the only one who improved his ability to predict spelling performance with 100% accuracy. Finally, the major qualitative differences found between the three teaching approaches were that the subjects who received the self-instructional and direct methods appreciated their remediation programs more then the subject who received the traditional method and that active participation in spelling remediation seemed to be an important motivator and contributer of positive perception of ability in spelling.

Discussion

The pre-testing, observational assessments, probing for verbal data, peer-teaching, and video-taping were very useful techniques in this study. Some or all of these techniques could aid teachers and program specialists in their construction of remediation programs for students with difficulty in spelling. The remediation programs were individually designed on the weekend days immediately following the assessments. Eventhough this required an intense effort within a short amount of time the realization that such a task can be accomplished might be encouraging for individuals that have similar diagnostic - prescriptive duties.

In general, the individual differences exhibited by the three subjects of this study reinforce the view that individualized programs should be designed for children with spelling difficulties. Furthermore, general assessments of spelling could not have revealed the differences these subjects demonstrated with respect to spelling performance and strategy employment. The construction of the remedial programs was aided by exploring the spelling strategies used by these subjects.

Generalization of instructional effects was difficult in this study because of the uncontrolled variables such as motivation and attention and because of the inability to assess the teacher effects and laboratory versus classroom effects. Nevertheless, the results of the follow up spelling test on the remediation words suggests that the self-instructional design was successful for Subject 3 in learning and maintaining the correct spelling of familiar words and increasing prediction ability. This is consistent with the results of the pilot study and subsequent classroom use. The attitudes of the three subjects also suggest that active participation influences spelling performance.

There was not a specific reinforcement system in effect during this study except for the self-reward requirement in the self-instructional design. However, all of the students received intermittent external reinforcements from their instructors throughout the project which was because of their participation in the summer program and also with respect to their particular efforts during the sessions. All of the students received verbal praise, refreshments and guided tours of the university campus from their instructors.

Assessments In Relation to Spelling and Cognitive Processes

The spelling assessments on the subjects of this study revealed commonalities of spelling weakness. All of the subjects demonstrated difficulty in phonetically decoding words which is consistant with the discovery by Spache (1940) and Gates (1937) who claimed that most spelling mistakes were phonetic in nature The phonetic analysis of the subjects' spelling performance suggested that they had a phonetic base but lacked knowledge of lexical spelling in some words (Tovey,1978). One of the primary difficulties exemplified Friths' (1979) view that many spelling errors are caused by words that do not reflect speech sounds.

All of the subjects displayed problems with sequencing ability which supports Porpodas' (1980) contention that spelling depends on permament storage of letter identity and sequence; Seymours' (1980) assumption that effective spelling depends on storage in memory of letter identity and sequence and that poor spellers seem to lack in storage; along with Stanovichs' (1980) opinion that spelling requires more attention to individual letters. The subjects also showed difficulty with vowel diphthongs and digraphs along with consistantly substituting and omitting letters throughout their spelling performance. This finding reinforces Hildreths' (1934) suggestion that 1/5 of spelling errors are due to vowel confusion and 1/2 are due to the insertion or omission of letters. Furthermore, most of the spelling mistakes by these subjects occurred in the middle of the words which is consistant with Jensons' (1962) error analysis.

The subjects of this study exhibited a weakness in spelling non-phonetic words and revealed a delay in sight word recognition ability with respect to their age and grade level. This evidence relates to Marshs' (1980) suggestion that good spellers often spell unknown words by analogy to the spelling of known words and that poor spellers seem to have fewer words in memory storage then good spellers, therefore, analogy useage is less effective. Due to their limited storage of words it appears that they have less mastery in orthographic patterns (Gibson, 1965) and are less dependent on visual experiences that aids in visual comparisons and recall of visual representations of words which leads to successful spelling (Hendrickson, 1967) Additionally, their limited word storage could be seen as influencing their ability to use abstraction from general patterns to aid their spelling of both phonetically and non-phonetically based words (Marsh, 1980).

All of the subjects verbalized and/or demonstrated spelling strategies that characterized varying amounts of spelling metaknowledge. They comprehended some of the skills necessary for accomplishing a spelling task,demonstrated strategies relevant to the task parameters, identified difficult dimensions in the successful performance of the task and displayed the understanding that correct pronounciation and attention to the task was important for successful spelling. They were all able to select some skills and strategies appropriate for the demands of spelling, hence, they all possessed spelling knowledge and metacognition germane to spelling performance along with showing attempts at controlling their spelling processes. However, in support of Torgesens' (1977) view that learning disabled children develop a passive or uninvolved style to learning, these subjects reported that they spend very little time studying spelling words independent of teacher demands. Torgessen also suggests that many learning disabled children fail in academic tasks due to inefficient problem solving strategies and that they are not stimulated to develop strategic learning behavior to the same extent as normal children. After analyzing the strategy employment of the subjects of this study from verbal data and behavioral observation the results suggest that they used inconsistant and inefficient spelling strategies which was influencing their spelling performance. However, the subjects who received the "Direct" and the "CBM Self-Instructional" approaches to spelling became actively involved in the learning process and enjoyed their sessions. The subject who received the "Traditional" approach to spelling and was not stimulated in becoming actively involved with his spelling remediation program became less enthused about his sessions. This finding supports Halls' (1978) opinion that learning disabled children can be taught appropriate problem solving strategies and that by encouraging active participation an interest in spelling can become revitalized (Monson, 1975) and lead to more personal involvement and successful performance.

Assessments in Relation to Metacognition

In a previous section the strategies used by each subject were individually outlined. For the purposes of comparison the next section will delineate the similarities and differences between all the subjects' metaknowledge and strategy employment. Studying spelling words, remembering sequences of letters, comprehending letter-sound correspondences, recognizing words that do not contain regular orthographic patterns and co-ordinating motor skills with cognitive processes involves deliberate plans and skills (strategies). The learner must "co-ordinate a variety of information regarding the task and his available strategies and apply it appropriately to the problem at hand" (Myers and Paris, 1978, p.680). General knowledge about the task (metaknowledge) that guides the selection and utilization of task relevant skills has been referred to as metacognition (Flavell, 1977). Metacognitive knowledge co-ordinates and directs the learners' thinking and behavior

(Myers and Paris, 1978). Flavell and Wellman (1977) identified person, task and strategy variables as three important categories of metacognitive knowledge that might aid memory. Children must first be able to realize their own ability and potential related to the task demand. Children must know the purpose and requirements of the task and need to be aware of the relevant strategies (skills) and their application. "The basic skills include predicting the consequences of an action or event, checking the results of ones' own actions (did it work?), monitoring ones' own activity (how am I doing?), and reality testing (does this make sense?) (Brown and De Loache, 1978,p. 14-15).

In reference to the above conditions the children in this study had intelligence within the average range but were significantly below average in their spelling ability. Furthermore, they all indicated low perception of ability in spelling on the academic self concept measure (SPAS),however, they all demonstrated a willingness to improve their spelling performance (for example, they all reported to their instructors that they appreciated being part of the program). Additionally, eventhough their performance on the assessments indicated ability deficits their intelligence scores and demonstrated efforts intimated the potential and capacity for improving their spelling performance.

The studys' investigation on the strategy employment of these students revealed a general knowledge base (metaknowledge) with respect to the purpose of spelling (ie. "It is important for success in school") along with showing that these students were aware of some of the requirements and skills (strategies) needed for spelling proficiency.

They expressed an awareness with respect to their limitations (ie. by reporting the need to be alone when studying to avoid distractions and by stating their need for teacher supervision in order to stay on task and complete their spelling assignments) but did not report factors such as personal incentive or motivation as a way to overcome these barriers. They were aware of the facilitative effects of such things as word familiarity, recursive operations (repeating letters or words over again to form mental images) and memorization along with being aware of the difficulty posed by such things as irregular orthographic patterns, word length and their phonetic limitations. Furthermore, they were conscious of the utility of spelling (ie. "important for future employment"),that it made sense to study words that caused them difficulty and that understanding the meaning of words was important for writing (ie. "I only study words I don't know", "Writing stories in school is difficult for me so being a better speller could help me").

Even though the students indicated a general spelling metaknowledge and an awareness of some of the skills necessary in spelling it was observed that they were not aware some other important task relevant strategies nor applied their own consistantly and/or effectively. None of the subjects checked the results of their actions while spelling, monitored their activities or showed an ability to accurately predict their spelling performance. Hence, according to Brown and De Loache (1978) these children lacked very important task and strategy variables of metacognitive knowledge that might have effected their spelling achievement. They appeared to be aware of mnemonic skills (ie. imagery and rehearsal) and goals (ie. memorization of letter sequences) which supports Flavell and Welmans' (1977) view that children between the ages of 6 and 12 acquire mnemonics for various task demands, however, their deployment appeared to be inconsistant and generalized rather than regular and task specific. For example, all of the subjects reported to their instructors that rehearsal of letters aided their recall and that they relied on phonetics when studying difficult words,however, the observations revealed that they did not usually rehearse letters or consistantly use a phonetic approach with difficult words assigned to them.

In summary, the students appeared to induce and abstract metacognitive strategies from a general repertoire of spelling knowledge representing a general plan rather than being strategy specific in accordance with the particular situational features. For example, rehearsing letters of words that have irregular orthographic patterns such as "laugh" and phonetically decoding others such as "interesting".However, the metacognitive analysis indicated that these students did possess some spelling metacognition (Knowledge and strategies). The following outline contains verbalized responses by the subjects to their instructors questions regarding their methods for studying spelling words.

Metacognition Common To All Subjects

1. Spelling involves sequencing of letters.
2. Studying difficult spelling words requires a phonetic approach.
3. Overt-verbalizations of letters and/or words aids spelling performance.
4. Rehearsal of letters, letter strings and/or words aids recall.
5. Visualizing the word aids spelling performance.
6. Memorization aids spelling performance.

Metacognition Common To Subjects 1 & 2

1. Overt-verbalizations of letters and/or words aids spelling performance.
2. Writing spelling words aids studying
3. Knowing the meanings of the words aids spelling performance.
4. The correct sequencing of letters is important in

spelling.

5. Visualizing the spelling words aids spelling performance.
6. Studying difficult words requires a phonetic approach.
7. Memorization aids spelling performance.
8. Rehearsal of letters and/or letter strings aids spelling performance.

Metacognition Common To Subjects 1 & 3

1. Overt-verbalizations of letters and/or words aids spelling performance.
2. Memorization aids spelling performance.
3. Visualizing the words aids spelling performance.
4. Rehearsal of letters and/or letter strings aids spelling performance.
5. Medial positions in words are the most difficult to remember and spell.
6. Studying difficult words requires a phonetic approach.
7. Spelling involves sequencing of letters.

Metacognition Common To Subjects 2 & 3

1. Overt-verbalizations of letters and/or words aids spelling performance.
2. Memorization aids spelling performance.
3. Visualizing the words aids spelling performance.

4. Rehearsal of letters and/or letter strings aids spelling performance.
5. Studying difficult spelling words requires a phonetic approach.
6. Correct sequencing of letters aids spelling performance.

Idiosyncratic Metacognition

1. The studying of spelling should be based on unfamiliar words (Subject 1).
2. Checking your spelling is important (Subject 3).
3. The application of spelling rules aids spelling performance (Subject 3)
4. The spelling of difficult words is aided by finding analogous words (Subject 3).

Taken together, the subjects reported many spelling skills (strategies) needed for proficient spelling which are supported by research. They stated the importance of letter identity, sequencing and memory (Glusker,1967, Porpodas, 1980) along with the need for visual representation of words for successful spelling Hendrickson,1967, Tovey,1978). They reported that phonetic approaches are useful (Schwartz & Doehring,1977), that the medial position of letters in words are the most difficult to recall (Jensen,1962) and that word meaning is important (Hillerich,1977). Additionally, they stated that writing their spelling words aids recall (Rudman,1973), that spelling requires more attention to the individual letters of the word (Stanovich,1980) and that verbalizing the letters and/or words aids recall and spelling performance (Bradley,1981). Furthermore, Subject 3 recommended using analogous words and category searching as a spelling strategy which supports Mandlers' (1967) view that sorting words in list categories promotes incidental recall.

Even though these subjects reported many effective spelling strategies they generally applied them inefficiently and inconsistantly. For example, it was observed that their phonetic ability usually impeded their use of a decoding strategy because they often mispronounced the words and were therefore learning incorrectly. Subjects 1 and 2 reported that writing the words and verbalizing the letters aided their recall, however, it was observed that they did not usually use this strategy and were more apt to write the word without rehearsing the letters or monitoring their performance. Subjects 1 and 2 reported that visualizing the words was an effective strategy, however, the observations suggested that they did not concentrate on forming visual representations due to the small amount of time allotted by them for studying each word and because they often appeared restless and off task during their assigned study time. Subjects 1 and 2 reported the greater difficulty they had with remembering the middle parts of words, however, the observations suggested that they did not spend more of their time studying the medial positions of words compared to the other parts of the words. Subject 3 reported that some of his spelling strategies included checking his spelling word with the correct spelling while studying, looking at each word carefully, verbalizing the word and rehearsing the individual letters of the word, however, the observations revealed that he seldom used these strategies and was more apt to skim his study list and perform his strategies irregularly.

In summary, the investigation of these subjects' spelling strategies showed that they were aware of many skills applicable for studying spelling words, however, failed to use their metacognitive knowledge in a regulated and effectual manner. Specifically, their spelling performance was deliteriously influenced by their ability deficits along with their inability to monitor and check their studying performance and use their preferred strategies efficiently and consistantly.

Recommendations for Teachers

This study supports Torgessens (1977) view that one of the reasons for learning disabled childrens difficulties with academic tasks is their inefficient use of problem solving strategies and Halls' (1978) contention that they can be taught effective and efficient problem solving strategies. This study also indicates that the CBM self-instructional proceedure has potential for inducing confidence and satisfaction independent of others (Bornstein & Quevillon, 1976) along with encouraging internal motivation which research suggests (Pearl & Bryan,1979) they lack. The results of this study supports research (Henker,et al;1980) that recommends active particpation, purposeful spelling study (Cohen,1969) and individual rather then group instruction (Stowitscheck & Jobes,1977). The results suggest that all three teaching approaches produced some improvement in spelling performance but that the self-instructional and direct methods dealt with individual differences more efficiently and effectively. This study reinforces Graves (1976) recommendation that spelling texts should be re-evaluated. They do not appear flexible enough to meet the demands of the individual. The direct instruction procedure would be efficient for group and individual remediation if a homogenous group of students were identified that required the same needs. The self-instructional proceedure has an advantage over the other methods in that it allows students to work at their own pace and ability level independently. The teacher would need to adequately assess the students strengths and weaknesses along with his/her strategy employment and be prepared to modify the CBM method accordingly, however, the time spent doing this might be less then what is required for traditional spelling approaches.Furthermore, the evidence indicates that the self-instructional procedure may promote more interest and ability in spelling performance.

This study did not specifically attempt to teach word attack skills, phonetic decoding and encoding, improve spelling on unfamiliar spelling words or enhance sight word recognition ability. This study explored spelling strategies and used three teaching approaches for remediating the spelling performance on familiar misspelled words. This study was conducted over four weeks and did not expect differences to be found on the post-tests that measured ability in phonetic analysis, word attack skills or sight word recognition. This study does not suggest that these areas be overlooked. The recommendation is that teachers should investigate all areas that influence spelling performance, include assessment of individual strategy employment and provide spelling programs that more adequately meet the needs of students. The direct instructional approach may be the most effective method for covering all the areas related to proficient spelling and the self-instructional approach may provide the student with an effective and rewarding method for studying and maintaining familiar spelling words.

Future Research

This study has indicated that spelling is one subject that children require individualized instruction and that group methods such as the Traditional" approach that was investigated are very often inappropriate. The observational analysis and verbal reports from this study suggest that studying spelling is a complex skill. The methods used in this study should be replicated with other students to discover if there is common spelling metaknowledge and spelling strategies used by normal and learning disabled children which would more clearly differentiate the two groups of children and allow program specialists to design spelling study programs that would require less modification by teachers for use within their classrooms. This study should be replicated within more natural enviroments with many more children and teachers in order to examine generalization more effectively. Future research should also control for teacher effects, motivation, attention, ability,strengths, weaknesses, and metacognition in order to assess the effects they might have on various remediation approaches.

The ability of the instructors to obtain verbal data was aided by the subjects expressive language skills, willingness to co-operate and by the instructors continual patience and probing. The collecting of verbal data was aided by the suggestions of Ericsson and Simon (1980) who recommended that inquiries be made as soon as possible after the event, probing should be minimized, examination of the internal consistency of the reports should be made (which was done by using the informal spelling assessments, peer-teaching and by video-taping self study), and asking for only simple descriptions while avoiding "why" questions. The exploration of spelling strategies was aided by Meiechenbaums' suggestion that several types of verbal protocals and probing devices be used in order to uncover similar response patterns across methods (for example, Informal Spelling Assessments, Parts 1,2 and3). This study provides evidence for the effectiveness of these recommendations which should be replicated with other students of similar age and grade level in order to support this studys' findings.

The CBM self-instructional procedure used in this study was beneficial for learning and maintaining familiar spelling words. It enhanced the learning process and seemed to make the study of spelling words more interesting and enjoyable. The initial stages of the CBM procedure did not appear to effect the amount of learning and resulted in significant spelling improvement. Follow up studies should be made in order to discover if this procedure has similar results with other students.

The subjects involved in the "Direct" and "Self-instructional" procedures seemed to be positively influenced by the information provided them by their instructors regarding their strategy employment and spelling weaknesses and strengths. Both designs involved external (teacher) and child participation which seemed to make the studying of spelling words more "personal" (Adelman, 1971) and effective. All of the program designs were concerned with minimizing failure by carefully structuring tasks and training, ascertaining the subjects' cognitive skill level and language maturity and assessing the difficulty of the tasks to make sure that the goal of each approach coincided with the childs' ability. Future research should control for these influences and study them separately in order to assess the effects they may each or collectively have on learning and studying spelling. The "Self-instructional" and "Direct" approaches seemed to increase self-esteem and have motivational properties as well. These approaches appeared to result in sustained goal oriented performance. However, this study did not specifically study these qualities which would be of interest in future research.

Conclusion

The results of this study suggest that instructional activities particularly the CBM approach may influence and facilitate self-guided behavior. Teacher modeling and student practice of cognitive processes through overt verbalizations can provide a motivating opportunity for students (Davey, 1983). This investigation has shown that they may lead to effective spelling and develop independent competence within the learner. The description of task goals and strategies to the student appears to lead to deliberate attention to the task and initiated self-regulatory participation in studying the remediation spelling words.

Remedial action addressing metacognitive insufficiencies has been suggested by some researchers (Brown & Palinscar, 1982; Wong and Jones, 1982) and in this study resulted in a more comprehensive understanding of the reasons underlying spelling difficulty. "Metacognitive skills are thought to underlie the smooth co-ordination of various task parameters in a students' successful learning or performance. Thus, they can provide additional dimensions in our investigations into learning disabled students academic failures" (Wong, 1982, p.25).

Ability deficits along with cognitive processes should be examined during an assessment. Furthermore, the learning disabled students' problems should be explored through the interaction of learner characteristics, learning activities, nature of the materials to be learned and the critical tasks (Jenkins, 1979). The mature learner has at his disposal various strategies for effective study (Brown and Smiley, 1978). This study has indicated that it may be important that the learner know or be shown how to orchestrate the utilization of these strategies in an organized fashion by doing such things as checking and monitoring in order to enhance successful task performance. Training should provide both "practice in the use of task appropriate strategies along with instruction concerning the significance of those activities and instruction concerning the monitoring and control of strategy use" (Brown and Smiley, 1982, p.7). This should be done in accordance with the needs of the individual student. Additionally, the development of automatic skills such as decoding through phonetic approaches should still be employed in order to increase the spellers' repertoire of knowledge. In light of the results of this study the self-instructional approach

(CBM) is viewed as a compliment to the acquisition of spelling skills. Its' merit may lie in the development of independent study of familiar spelling words and improved spelling performance. Various task parameters such as word attack skills should be directly taught in order to increase the learners' knowledge and skill along with developing the learners' metacognition.

Although there has not been any previous studies that have explored the strategies used by children who have spelling difficulty or have used cognitive behavior modification in the remediation of spelling performance, the approach appears to be effective and efficient for studying familiar spelling words. Eventhough it needs more applied research, the theory associated with the design appears well founded and the findings to date are promising.

This study further supports the advantages of single subject research and the exploration of spelling metaknowledge and strategies with children. It also encourages the investigation of strategy employment with larger groups of children including both disabled and non-disabled in a variety of subject areas.

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Appendix A

Test Instruments and Word Lists

Pairs Test of Decoding Skills

Subtest A Initial Consonants

1. toy-boy
2. fin-bin
3. tap-cup
4. sup-cup
5. hot-dot
6. him-dim
7. sun-fun
8. sell-fell
9. tap-gap
10. sob-gob
11. cut-nut
12. sip-hip
13. lump-jump
14. tab-jab
15. dot-lot
16. tap-lap
17. rap-map
18. hill-mill
19. nub-nib
20. get-net
21. kin-pin
22. bat-pat
23. hip-rip
24. cut-rut
25. cut-rut
26. mix-six
27. bell-tell
28. hip-dip
29. fin-win
30. tell-well
31. nip-yip
32. jell-yell

Subtest B Final Consonants

1. pit-pin
2. rug-run
3. bet-ben
4. sap-sad
5. bat-bag
6. rip-rig
7. fan-fat
8. leg-let
9. sit-sip
10. sod-sop
11. hip-him
12. rag-ram
13. peg-pen
14. ram-ran
15. bit-bib
16. lag-lap

Subtest C Middle Short Vowels

1. fix-fox
2. dug-dog
3. bad-bid
4. hop-hip
5. pin-pen
6. lot-let
7. cap-cup
8. fin-fun
9. him-ham
10. rut-rat

Subtest D Middle Long Vowels and Vowel Digraphs

1. ran-rain

7. bed-bead

13. shot-shone

2. plan-plain
3. dim-dime
4. slid-slide
5. hat-hate
6. scrap-scrape
8. sell-seal
9. cost-coast
10. got-goat
11. fond-found
12. shot-shout
14. spot-spoke
15. blot-blow
16. slop-slow

Subtest E Initial Consonant Blends and Digraphs

1. ring-thing
2. bud-thud
3. tip-whip
4. file-while
5. hop-shop
6. tell-shell
7. till-chill
8. burn-churn
9. bag-flag
10. stop-flop
11. kid-slid
12. bed-sled
13. clip-skip
14. fin-skin
15. ham-swam
16. dim-swim
17. hem-stem
18. hop-stop
19. slip-drip
20. bum-drum
21. flap-trap
22. him-trim

Subtest F Final Consonant Blends and Digraphs

1. bat-back
2. kid-kick
3. rat-rash
4. fin-fish
5. bad-bath
6. pill-pith
7. let-lend
8. pop-pond
9. pad-pant
10. hill-hint
11. dull-dusk
12. map-mask
13. fill-fist
14. lap-last
15. cask-camp
16. rat-ramp
17. salt-sank
18. cram-crank

Spelling of Word Parts

1. st
2. sk
3. bl
4. br
5. pr
6. cl
7. cr
8. qu
9. sh
10. ch
11. tr
12. th
13. dr
14. fr
15. fl
16. pl
17. ph
18. sl
19. sn
2o. sm
21. sp
22. wh
23. gr
24. oa
25. ea
26. ai
27. ing
28. un
29. er
30. ir
31. ar
32. ur
33. spl
34. ou
35. le
36. ee
37. ow
38. or
39. oy
40. ay
41. oo
42. ies
43. kn
44. in
45. ed
46. est

Consonant Blends,Digraphs and Dipthongs

1. st
2. sk
3. bl
4. br
5. cl
6. cr
7. pr
8. qu
9. sh
10. ch
11. tr
12. dr
13. fr
14. fl
15. pl
16. ph
17. sl
18. sm
19. sp
20. wh
21. gr
22. oa
23. ea
24. ai
25. ing
26. un
27. er
28. ir
29. ar
30. ur
31. spl
32. ou
33. le
34. ee
35. ow
36. or
37. oy
38. ay
39. oo
40. ies
41. kn
42. in
43. ed
44. est
45. th
46. sn

Alphabet Writing

1. Write the small letters of the alphabet.

2. Write the capital letters of the alphabet.

Diagnostic Spelling Test

Word	Element Tested
1. not	Short Vowels
2. but	
3. get	
4. sit	
5. man	
6. boat	Two Vowels Together
7. train	
8. time	Vowel-consonant-e
9. like	
10. found	ow-ou spelling of ou sound
11. down	
12. soon	Long and short oo
13. good	
14. very	Final y as short i
15. happy	
16. kept	c and k spellings of the k sound
17. come	
18. what	wh,th,sh,ch and ng spellings
19. those	and ow spelling of long o
20. show	
21. much	
22. sing	
23. will	Double final consonants
24. doll	
25. after	er spelling

26. sister	
27. toy	oy spelling of oi sound
28. say	ay spelling of long a sound
29. little	le ending
30. one	Non-phonetic spellings
31. would	
32. pretty	

Language Arts, Word Recognition Assessment, Stimuli

Level 3

1. present
2. pray
3. pretty
4. dream
5. drink
6. draw
7. Friday
8. frame
9. greater
10. thing
11. think
12. drive
13. trick
14. treat
15. trap
16. cross
17. cried
18. cream
19. broke
20. print
21. drag
22. nothing
23. good-bye
24. your
25. orange
26. page
27. large
28. start
29. dark
30. garden
31. Mr.
32. Mrs.
33. Miss
34. St.
35. Ms.
36. crop
37. leave
38. beaver
39. Easter
40. eaten
41. read
42. thread
43. jeans
44. alone
45. across
46. along
47. ago
48. alike
49. about
50. Thursday
51. Saturday
52. family
53. early
54. buy
55. fly
56. sky
57. yesterday
58. yourself
59. yet
60. lady
61. only
62. merry
63. sorry
64. won't
65. don't
66. can't
67. isn't
68. haven't
69. doesn't
70. didn't
71. tonight
72. shouldn't
73. wouldn't
74. what's
75. it's

76. bright
77. might
78. fight
79. high
80. around
81. scout
82. mouse
83. ground
84. flower
85. downstairs
86. knew
87. eight
88. hundred
89. before
90. behind
91. air
92. often
93. own
94. window
95. show
96. low
97. noon
98. poor
99. wood
100 wooden
101 ruler
102 broken
103 shout
104 golden
105 Wednesday
106 tomorrow

Level 4

1. farmer
2. turkey
3. rake
4. rich
5. barn
6. grain

7. grand
8. sheep
9. field
10. fork
11. worm
12. calf
13. better
14. cattle
15. mammal
16. wheat
17. July
18. sound
19. peach
20. apples
21. berry
22. pick
23. bunch
24. September
25. baskets
26. boxes
27. worked
28. pear
29. shake
30. ripen
31. movie
32. rather
33. gather
34. earn
35. wild
36. fail
37. chase
38. hurry
39. happen
40. middle
41. invite
42. war
43. marched
44. law
45. watched
46. stamp
47. ranch
48. gallop
49. shiny
50. glow
51. master
52. together
53. neat
54. heat
55. speak
56. lead
57. colt
58. goose
59. climbed
60. called
61. asked
62. dressed
63. tiny
64. reach
65. lamb
66. crow
67. cabin
68. tent
69. camping
70. blaze
71. between
72. twelve
73. twenty
74. twice
75. hike

76. float
77. brave
78. blade
79. coach
80. goalie
81. cave
82. save
83. aren't
84. knowing
85. laugh
86. led
87. form
88. follow
89. witch
90. failed
91. darker
92. drum
93. gnaw
94. ordered
95. canary
96. I've
97. angel
98. colour
99. fair
100. pair
101. ticket
102. watching
103. silver
104. sixty
105. belong
106. spoke
107. test
108. branch
109. runway
110. wings
111. airport
112. daytime
113. helicopter
114. tank
115. geese
116. feet
117. desires
118. alarm
119. monkey
120. turkeys
121. donkeys
122. wolf
123. brush
124. bunches
125. foxes
126. glasses
127. peaches
128. mice
129. ponies
130. calves
131. forest
132. fir
133. poplar
134. evergreen
135. shape
136. spruce
137. pine
138. pile
139. shady
140. maple
141. leaves
142. elm
143. trunk
144. path
145. birch
146. hardwood

Level 5

1. usual
2. scene
3. whistle
4. chose
5. picnic
6. began
7. freeze
8. blanket
9. holiday
10. lively
11. guilt
12. quiet
13. quarter
14. equal
15. less
16. guessed
17. offer
18. welcome
19. limb
20. apart
21. level
22. promise
23. trim
24. worth
25. fifth
26. market
27. none
28. finger
29. other
30. knock
31. knelt
32. steer
33. signal
34. minute
35. final
36. untie
37. idea
38. canoe
39. feather
40. iron
41. mild
42. rifle
43. hunt
44. member
45. capture
46. surprise
47. manner
48. stir
49. tribe
50. everybody
51. blame
52. throne
53. rise
54. tired
55. refuse
56. silent
57. idle
58. breaking
59. captive
60. answer
61. weigh
62. below
63. ease
64. prey
65. decay
66. claim
67. aid
68. lonesome
69. average
70. language
71. answered
72. listen
73. correct
74. addition
75. cliff
76. recess
77. perfect
78. chalk

79. check
80. pupil
81. student
82. mistake
83. divide
84. problem
85. dozen
86. term
87. decimal
88. rubber
89. matter
90. leader
91. remember
92. anger
93. verse
94. serve
95. mistaken
96. prison
97. slippery
98. moment
99. following
100. perhaps
101. drew
102. threw
103. shown
104. bent
105. birth
106. history
107. western
108. discover
109. explore
110. return
111. stormy
112. trying
113. settle
114. longer
115. growth
116. bowl
117. lower
118. narrow
119. arrow
120. powder
121. drown
122. crowd
123. borrow
124. able
125. however
126. allow
127. act
128. outdoors
129. ditch
130. patch
131. scratch
132. stretch
133. hatch
134. pitcher
135. butcher
136. future
137. grasshopper
138. post office
139. gentleman
140. question
141. twenty-five
142. strawberry
143. million
144. shipping
145. prepare
146. hire
147. cure
148. joke
149. damage
150. harvest
151. noise
152. kilogram
153. thresh
154. tractor
155. power
156. unite
157. uniform
158. clover
159. due

Familiar Misspelled Words Used for Remediation

1. freeze
2. holiday
3. breaking
4. correct
5. knock
6. answer
7. mistake
8. problem
9. shown
10. explore
11. dozen
12. following
13. aren't
14. between
15. mammal
16. growth
17. coach
18. berry
19. I've
20. knowing
21. ordered
22. branch
23. colour
24. helicopter
25. claim
26. perhaps
27. lively
28. alarm
29. neat
30. war
31. cattle
32. rifle
33. perfect
34. term
35. airport
36. return

Word List for Informal Diagnostic Assessment, Parts 1&2

Word List

1. groan
2. teach
3. raining
4. hunter
5. birth
6. hurt
7. storm
8. harder
9. tube
10. life
11. splash
12. ground
13. frog
14. jump
15. bed
16. will
17. hat
18. boat
19. chain
20. sleep
21. speak
22. cream
23. shine
24. gave
25. drove
26. teeth
27. show
28. sister
29. morning
30. church
31. garden
32. employ
33. away
34. little
35. third
36. when
37. hole
38. mouth
39. brown
40. window
41. spoon
42. cookies
43. thirty
44. kept
45. came
46. saying
47. well
48. grass
49. flower
50. know
51. interesting
52. would
53. laugh
54. eight
55. burned
56. farmed
57. helping
58. needing
60. putting
61. wiping
62. hoping
63. candies
64. armies
65. fastest
66. richest
67. notebook
68. sailboat
69. sight
70. night
71. paddle
72. fumble

Guideline Probes

1. If you were to teach someone younger than yourself how to spell this word, how would you do it?
2. For each word tell me what the most difficult part would be for you to remember?
3. What would be the easiest part of this word for you to remember?
4. How would you remember this word?
5. What could you do to help yourself remember this word?
6. What is Spelling?
7. Tell me some ways that spelling is important for you?
8. If I gave you some words to spell what would be the most difficult to spell, the first part, the middle or the last part?
9. Do you study by yourself or do you just do it when someone like your teacher or parent asks you to do it?
10. If you were a teacher how would you teach spelling?
11. What do you need to know before you can spell a word?
12. Does it help to have the correct spelling of the word close to you in order for you to study the word?
13. Does it help to say the sounds of the word?
14. Is there anything else you do to help yourself study spelling words?
15. Would it help to write the word down when studying the word?
16. Where is the best place for studying spelling words?

17. Can anybody be around you when you are studying spelling words?
18. Is it better to study by yourself or with someone else?
19. Can you study spelling while watching television?
20. How many words are best to study at one time?
21. Do you know when you have spelled a word correctly or incorrectly?
22. What are some ways that would help you remember how to study this word?
23. Does it help to know the meanings of words before you try to learn how to spell the word?
24. What could you do if someone asked you to study a word for a spelling test and you didn't know how to say the word?
25. Is spelling important? Can you tell me some of the ways spelling might be important?
26. What would be the first thing you would do if I asked you to learn how to spell this word for a spelling test? What would be the next thing you would do?

Format for Informal Diagnostic Assessment Part 3

1. g r o a n
gr oa n
gro an
groa n

2. t e a c h
t ea ch
tea ch
te a ch

3. r a i n i n g
r ai n ing
rai ning
rain ing
ra in ing

4. h u n t e r
h un t er
hun t er
hunt er

5. b i r t h
b ir th
bir th
b irth

6. h u r t
h ur t
h urt
hur t

7. s t o r m
st or m
s tor m
s torm
st orm

8. h a r d e r
h ar d er
h ar der
har der
hard er

9. t u b e
tu be
t ub e
tub e

10. l i f e
li fe
lif e
l ife

11. s p l a s h
sp la sh
spl a sh
spl ash
spla sh

12. g r o u n d
gr ou nd
gr ound
gro u nd
groun d
grou nd

13. f r o g
fr og
fro g
f rog

14. j u m p
ju mp
jum p
j ump

15. b e d
be d
b ed

16. w i l l
wi ll

17. h a t
ha t

18. b o a t
b oa t

w ill

h at

boa t
bo at

19. chain
ch ai n
ch ain
chai n
cha in

20. sleep
sl eep
sle ep
sl ee p
slee p

21. speak
sp ea k
spea k
sp eak
spe ak

22. cream
cr ea m
c re am
c rea m
crea m
cre am

23. shine
s hine
sh in e
sh ine
shin e
shi ne

24. gave
ga ve
gav e
g ave

25. drove
dr o ve
d rove
d ro ve
dr ove

26. teeth
t ee th
te e th
t eeth
te eth

27. show
sh ow
s how
sho w

28. sister
sis t er
sis ter
si ster
sist er

29. morning
mor ning
morn ing
m or n ing

30. church
ch ur ch
chur ch
chu rch

31. garden
g ar den
gar den
g ar d en

32. employ
em pl oy
em ploy
empl oy

33. away
a way
aw ay
awa y

gard en

34.l i t t l e
li tt le
lit tle
litt le
lit tl e

35.t h i r d
th ir d
thir d
th ird
thi rd

36.w h e n
wh en
w hen
whe n

37.h o l e
ho le
hol e
h ole

38.m o u t h
m ou th
mou th
mo u th
mo uth

39.b r o w n
br ow n
br own
brow n
b rown

40.w i n d o w
win dow
w in dow
wind ow

41.s p o o n
spoo n
sp oo n
s poon
sp oon

42.c o o k i e s
cook ies
c oo kies
coo kies
c oo ki es

43.t h i r t y
th ir ty
thir ty
th irty
t hir ty

44.k e p t
ke pt
kep t
k ept

45.c a m e
ca me
c ame
cam e

46.s a y i n g
say ing
s ay ing
sa y in g

47.w e l l
we ll
w ell
wel l

48.g r a s s
gr ass
g ra ss
gra ss

49.f l o w e r
f low er

50.k n o w
kn ow

51.i n t e r e s t i n g
int er es ting

fl ow er
flow er
fl ower
f low er

k now
k no w
kno w

in ter est ing
inter esting
inter est ing

52.w o u l d
w ou ld
wou ld
w ould
wo uld

53.l a u g h
lau gh
l au gh
l aug h
la ugh

54.e i g h t
ei g ht
e igh t
eig ht
eigh t

55.b u r n e d
b ur n ed
bur ned
burn ed
b ur ne d

56.f a r m e d
f ar m ed
far med
farm ed
fa rmed

57.h e l p i n g
help ing
h el ping
hel ping
he lp in g

58.n e e d i n g
n ee ding
need ing
ne ed ing
nee ding
ne ed in g

59.f i t t i n g
fi tt ing
fit ting
fitt ing
f it ting
f it ting

60.p u t t i n g
put ting
pu tting
putt ing
p ut ting
p utt ing

61.w i p i n g
wip ing
wi pi ing
w ip ing

62.h o p i n g
ho ping
hop ing
h op ing
ho pi ng

63.c a n d i e s
can di es
can dies
cand ies
can d ies
c an dies

64.a r m i e s

65.f a s t e s t

66.r i c h e s t

arm ies
ar mi es
arm i es
a rmi es
armi es

fas test
fast est
f as te st
fa st est

rich est
ri ch est
ri ch es t
r ich est

67.s i g h t
si gh t
s igh t
sig ht
sigh t

68.n i g h t
nig ht
nigh t
ni gh t
n igh t

69.n o t e b o o k
n ote bo ok
no te b oo k
note book
no te bo ok

70.p a d d l e
pa dd le
pad dle
padd le
p ad dle

71.f u m b l e
fumb le
fum ble
f umb le
fum bl e
fu mble

72.s a i l b o a t
s ai l bo at
sa il b oa t
s ail boa t
sail boat

Appendix B

Figures 1,2 & 3

Figure 1

Intelligence Tests----Abilities Testing----Educational
Performance Performance

Underlying Cognitive
Processes Effecting
Performance

COGNITION

Intellectual functioning of the mind characterized by remembering, comprehending, focusing, attending, and processing of information.

METACOGNITIVE KNOWLEDGE ------------------METACOGNITION------------------------EXECUTIVE PROCESSES

METACOGNITIVE KNOWLEDGE

"The how of my action"
It is knowledge of ones' cognitive activity.
It is:
Domain Specific
Task Specific
Conscious
Reportable

METACOGNITION

Important for reflection of cognitive processes and control of cognitive processes. It is knowledge about cognition and the regulation of cognition. It demands introspection, reflection and awareness about cognitive processes.

EXECUTIVE PROCESSES

"The regulation of my action'
It is reportable.
It involves:
Planning Checking
Analyzing Evaluating
Monitoring Modifying

COGNITIVE STRATEGY

Method by which an individual skillfully and efficiently solves a problem It involves procedural knowledge and has behavioral consequences. It is a rule, specific behavior or mechanism to solve a problem in a means end fashion.

AUTOMATICITY

Performance without reflection or conscious regulation as in efficient problem solvers(experts)

Figure 2

COGNITIVE BEHAVIOR MODIFICATION

PRIMARY FOCUS

Thought processes

AIMS

To deal with internalized speech.
To use inner speech to guide behavior.
To influence thought patterns.
To teach appropriate task relevant cognitions.

TRAINING

Principle Components:Modeling (means of instruction)
Active participatio
Self-instruction
Self-reinforcement
Self-assessment
Self-verbalizations

Based on the belief that maladaptive performance is due to poorly organized cognitions and that self-verbalizations contribute to the cognitive style.

Aids in organizing and regulating strategies available to the learner.

INFLUENCES

Belief that deficient performance is due to afailure to employ efficient task strategies.

Notion of self-regulation

Attribution theory

Self-efficacy

ASSESSMENT

It is a cognitive functioning analysis where an inventory of strategies are examined in relation to task parameters.

The strategy investigation looks at the quality of failure.

RELATIONSHIP TO METACOGNITION

Exceptional children have defective metacognitive processes.

Many children have processing disorder particularly in the areas of attention, perception and language.

BELIEFS

By changing cognitions behavior can be changed.

Cognitions as measured by oral reports of self-statements mediate abnormal behavior.

Figure 3

FACTORS INVOLVED IN METACOGNITIVE ASSESSMENT

INTERVIEW	BEHAVIORAL OBSERVATION	CONCURRENT SELF-REPORTS	PAST PERFORMANCE	THINK ALOUDS	VERBAL REPORTS
This is like dialoguing. The aim is to draw out childs' thoughts by using informal and formal questions. Should tap a variety of variables	Quantitative analysis Looks for: monitoring checking attention to task ,etc.	Ask questions as soon as possible. Minimize probing. Ask for verbal descriptions.	Information may be rationalization of cognitive processes.	May interfere with activity. May be intellectualization rather than example of process.	May be access to content and not process. Lack of reporting may be due to automaticity. Be aware of superficial processing and social desireability responses.

VARIABLES

PERSON	TASK
Attribution Development Expertise Memory Verbal ability	Understanding of skill and purpose. Knowledge of such things as: categorization study time effects

STRATEGY

Things that might help the child remember effectively.
Internal aids
External aids

MATERIALS

Examine content validity.

CRITERIAL TASKS

Do they tap processes?

USE CONVERGING MEASURES

PERFORMANCE ANALYSIS

ANALYZE INTERNAL CONSISTENCY

USE TASKS WHERE THE COGNITIVE PROCESSES COME INTO PLAY